Energy Efficiency: DOE's Regional Standards for Indoor (Non-Weatherized) Residential Gas Furnaces

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Summary

This report reviews the background, regulatory framework, and policy issues that have shaped the debate over regional energy efficiency standards for residential natural gas furnaces. Those furnaces are the most common type of home heating appliance. While the scope of the report is limited to that one type of furnace, much of the discussion also applies to standards for other furnaces and to standards for residential central air conditioners and heat pumps.

A 1987 statutory congressional directive set gas furnace standards for 1992 and directed the Department of Energy (DOE) to consider raising the standards in 1994 and 2007. DOE's responses were challenged in court twice (2005, 2007). The Energy Independence and Security Act (EISA) authorized DOE to set new standards for residential natural gas furnaces and certain other equipment. EISA Section 306 empowered DOE to set both a "technical" standard for manufacturers (a base national standard) and a regional "installation" standard for distributors and contractors. The regional standard concept aims to address geographic differences in heating needs. This law marked the first time that Congress authorized DOE to set regional standards.

All other previous DOE energy efficiency standards for consumer products—whether set by law or by DOE rule—had only created a national technical standard for manufacturers. In that case, the compliance date served as *a deadline only for manufacturers* to have retooled their production lines, so that new equipment would comply with the new energy efficiency criteria. As the inventory of "old" equipment became exhausted, the "new" equipment from manufacturers would gradually replace it in the supply chain. Ultimately, the equipment distributors and residential installers at the end of the supply chain would have only the new equipment available to them.

In contrast, the DOE-proposed regional gas furnace standard would have set the same compliance date for both manufacturers and installers. This would effectively *move the scheduled implementation date down the supply chain* from manufacturers, and thereby accelerate the change-over requirement date and *shorten the "sell-through" adjustment period for furnace distributors and contractors*.

In another departure from past practice, EISA Section 308 specified that DOE could employ a direct final rule (DFR) process to implement the new regional standards. This is another policy innovation that had not been used previously in the appliance standard-making process. The DFR process—which relies upon a preliminary consensus agreement among industry and energy efficiency groups—differs from the "traditional" notice-and-comment process that had been used in all previous DOE rulemakings for consumer product energy efficiency standards.

The two innovations—regional standards and the DFR process—led to new uncertainties and implementation design issues which, in late 2011, prompted an industry court challenge. In April 2014, the court adopted a negotiated settlement that directs DOE to reformulate the gas furnace rulemaking and directs that standards for air conditioners and heat pumps begin in 2015 and 2016. The final rule for gas furnaces had been set for May 2013—but the new, revised rule is not expected to take effect before 2021 or 2022. In October 2014, gas industry groups raised the issue of separating gas furnace product classes in the revised rulemaking. One report suggests that the court-adopted settlement which directs DOE to "reformulate" the residential gas furnace standard could influence the development of several other energy efficiency standards processes that are underway.

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Background

Space heating is the largest energy-using activity in the residential sector, accounting for nearly 40% of total residential energy use. Natural gas furnaces account for about half of that total.[1] About 40% of households use natural gas furnaces—the most common type of equipment and fuel—used for space heating.[2]

Residential Furnaces

Furnaces are the most common type of residential central heating equipment in the nation. Residential furnaces come in a variety of designs, each of which employs a different fuel. Natural gas furnaces are, by far, the dominant type.[3] A furnace produces hot air that is distributed throughout the home by a ventilation duct system.[4] There are two main types of residential furnaces: weatherized (for outdoor installation, such as on rooftops) and non-weatherized (installed indoors, often in a basement or special closet). Non-weatherized furnaces are far more common and come in two forms: condensing and non-condensing. Furnaces with a 90% or greater AFUE (annual fuel utilization efficiency) are known as "condensing" furnaces because they condense water out of exiting (exhaust) flue gases to recover heat to further warm the home. Those exhaust gases would otherwise be vented up the chimney.[5] A non-condensing furnace does not have the secondary system to recapture heat from byproduct moisture and gases. Thus, it requires a chimney or other exhaust venting to allow the larger amount of waste gases to escape. **Appendix A** provides an illustration of a non-condensing natural gas furnace.[6]

EPCA, NAECA, and Previous DOE Rulemakings

This section recounts the beginning stages of federal policymaking for energy efficiency standards for residential gas furnaces. Subsequent sections continue to trace the evolution of this vein of energy efficiency policymaking. **Appendix B** provides a chronology of key policy developments in the evolution of policy for regional energy efficiency standards for those furnaces.

The Energy Policy and Conservation Act of 1975 (EPCA, P.L. 94-163) established voluntary national energy efficiency targets for various types of residential appliances and commercial equipment, including residential furnaces.[7] Also, EPCA authorized the Federal Energy

[1] DOE Energy Information Administration (EIA), *Gas Furnace Efficiency Has Large Implications for Residential Natural Gas Use*, December 5, 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=14051.

[2] Also, slightly more than 14% use electric furnaces and about 3% use oil furnaces. Appliance Standards Awareness Project, *Furnaces*, http://www.appliance-standards.org/product/furnaces.

[3] Natural gas furnaces account for about 90% of annual sales of residential furnaces. Other furnace types employ oil, propane, or electricity.

[4] Some furnaces, a relatively small percentage of national sales, operate on electricity instead of a combustible fuel.

[5] A condensing furnace captures as much available energy as possible to convert it into useful heat. Instead of wasting the heat content in moisture and exhaust gases that otherwise drain through pipes to the outdoors, where they would evaporate, a condensing furnace essentially recycles these resources into usable energy for home heating. After that, a fan vents a small amount of moisture and gases outdoors through a PVC pipe.

[6] DOE, *Residential Furnaces and Boilers*, http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/72.

[7] California first began regulating appliance standards in the 1970s, and New York (state) and Minnesota quickly followed.

Administration (FEA) to administer the targets and directed the Federal Trade Commission (FTC) to provide energy labels for equipment covered by the targets. When FEA became part of the new Department of Energy (DOE) in 1978, the regulatory authority was transferred to the Secretary of Energy. The National Energy Conservation Policy Act of 1978 (NECPA, P.L. 95-619) further authorized DOE to set and enforce mandatory energy efficiency standards.

EPCA, as amended, establishes criteria to guide the process of amending standards for "covered products."[8] The law directs that any amended standard for a covered product must be designed to achieve the *maximum improvement in energy efficiency* that is *technologically feasible* and *economically justified*.[9] Further, EPCA precludes DOE from adopting any standard that would not result in *significant conservation of energy*.[10] EPCA also requires that, in deciding whether a standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens.[11] DOE must do so only after receiving comments on the proposed standard and by considering, "to the greatest extent practicable," several factors: (1) the economic impact on manufacturers and consumers, (2) operating cost savings over the estimated average life of equipment compared with any increase in price, (3) total projected energy savings, (4) any lessening of usefulness or performance, (5) any lessening of market competition, (6) the need for energy conservation, and (7) any other factors DOE deems relevant.[12]

The National Appliance Energy Conservation Act of 1987 (NAECA, P.L. 100-12) amended EPCA to establish energy conservation standards by statute for residential furnaces and boilers. NAECA set a minimum national standard of 78% AFUE for residential oil and gas furnaces.[13] The standard was scheduled to take effect on January 1, 1992. Also, NAECA amended EPCA to require DOE to consider amending the 78% AFUE standard in two subsequent rulemakings.[14] First, the law required DOE to publish a final rule no later than January 1, 1994, to determine if the initial statutory efficiency standards for furnaces should be amended.[15] Second, the law directed DOE to publish the second final rule by January 1, 2007, to determine whether efficiency standards for furnaces should be further amended.

DOE missed EPCA's 1994 deadline for a new rulemaking. In August 2005, the Energy Policy Act of 2005 (EPAct 2005, P.L. 109-58) was enacted. Section 141 of EPAct 2005 directs DOE to develop a plan to issue expeditiously efficiency standards for those products for which DOE had not yet met the deadlines specified by the NAECA amendments to EPCA. Section 141 also required that DOE submit semi-annual reports on its standard-setting activities. The first of those reports was published in January 2006.[16]

[8] "Covered products" is the formal term used to mean appliances and other equipment, such as natural gas furnaces.

[9] 42 U.S.C. §6295(o)(2)(A).

[10] 42 U.S.C. §6295(o)(3)(B).

[11] 42 U.S.C. §6295(o)(2)(B)(i).

[12] Ibid.

[13] This was the first time that federal minimum energy efficiency standards were established for residential furnaces and for other types of residential equipment.

[14] NAECA also set standards for central air conditioners and heat pumps. The National Appliance Energy Conservation Act Amendments of 1988 (P.L. 100-357) amended EPCA to add standards for certain types of lighting equipment.

[15] Especially whether the level of efficiency specified in the standard should be increased.

[16] DOE, *Energy Conservation Standards Activities*, January 2006, http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/congressional_report_013106.pdf. For a list of all subsequent reports, see http://www1.eere.energy.gov/buildings/appliance_standards/reports_and_publications.html.

Parties Challenge DOE for Failure to Issue Final Rule for New Standards

In September 2005, a number of states and environmental groups brought a suit in the U.S. District Court for the Southern District of New York challenging DOE's failure to comply with EPCA's mandate to adopt certain efficiency standards by established deadlines for various categories of products, including residential furnaces.[17] The parties eventually entered into a consent decree, pursuant to which DOE agreed to deadlines for taking various actions concerning efficiency standards for each product category.[18] The consent decree required DOE to adopt a rule for furnace efficiency standards by September 30, 2007.[19] The court eventually terminated the consent decree, finding that DOE had completed all of the required actions.[20]

DOE's 80% AFUE Rule Challenged by Industry, States, and Others

Pursuant to the requirements of the consent decree described above, DOE published a final rule in November 2007 that would have raised the residential gas furnace efficiency standard from 78% to 80% AFUE.[21] The rule established a final compliance date of November 19, 2015.[22] DOE believed that publishing the rule fulfilled its obligation under the consent decree mentioned above.

However, the rule was met with criticism from states and public interest groups who felt the rule should have demanded a greater increase in the efficiency standards. In January 2008, two parallel challenges to the DOE Final Rule were filed in the U.S. Court of Appeals for the Second Circuit.[23] The challenges took issue with perceived flaws in DOE's economic analysis as well as the allegedly minimal energy saving associated with the 80% standard. One challenge noted that DOE had found that "a 90% standard would result in average life cycle costs (LCC) savings on a national level of $55 per consumer, while the 80% standard would result in only $2 of LCC savings per consumer" due to "DOE's assumption that by 2015, 99% of households will purchase furnaces that achieve the 80% efficiency level irrespective of any revision of standards."[24]

Some states also expressed a concern that the 80% AFUE national efficiency standard would preempt stricter state standards. For example, the state of California filed a motion to intervene in the State challenge to the DOE standards in which it contended that "[i]f DOE's weak standards

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[17] U.S. District Court for the Southern District of New York, *State of New York et al. vs. DOE: Complaint for Declaratory and Injunctive Relief* (05 CV 7807), September 7, 2005, http://www.nj.gov/oag/newsreleases05/complaint-doe-070105-states.pdf.

[18] Consent Decree, State of New York et al. vs. Bodman et al. (No. 5-7807) and Natural Resources Defense Council, Inc. et al. vs. Bodman (No. 5-7808) (November 6, 2006). The Consent Decree addressed two consolidated cases, New York et al. vs. Bodman (DOE), No. 05-7807 (S.D.N.Y. Nov. 3, 2007), and Natural Resources Defense Council et al. vs. Bodman (DOE). The text of the decree is available at http://oag.ca.gov/sites/all/files/pdfs/environment/2-27-08consent_decree_NYvBodman.pdf.

[19] Ibid. at 9.

[20] Endorsed Letter, State of New York et al. vs. Bodman et al. (No. 5-7807) and Natural Resources Defense Council, Inc. et al. vs. Bodman (No. 5-7808) (May 1, 2012).

[21] Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers, 72 Fed. Reg. 64, 156 (November 19, 2007).

[22] Ibid.

[23] State of New York et al. vs. U.S. Department of Energy, No. 08-0311 (2nd Cir. Jan. 17, 2008); Natural Resources Defense Council vs. U.S. Department of Energy, No. 08-0312 (2nd Cir Jan 17, 2008).

[24] Final Opening Brief for Government Petitioners, State of New York et al. vs. U.S. Department of Energy, No. 08-0311 (2nd Cir. September 3, 2008) at 16 (citing "Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers," 72 *Federal Register* 65156, November 19, 2007).

for residential furnaces and boilers are permitted to stand, California will lose the opportunity to benefit from a more stringent rule."[25]

Other states also raised concerns about the new federal standards preempting stricter state standards. For example, in October 2009, the state of Massachusetts delivered a waiver petition to DOE seeking state exemption from DOE's 80% AFUE rule—which would preempt its state standard of 90% for non-weatherized residential gas furnaces.[26] In October 2010, DOE issued a denial of the petition.[27]

In response to the legal challenges to the 80% rule and the state preemption concerns, DOE reasserted its position that it had previously determined that a 90% regional standard was beyond the scope of its statutory authority, but that it did have authority to grant state waivers.[28] In response to these concerns regarding the energy savings impact of the proposed efficiency standard and the concerns regarding preemption, DOE sought and was granted a remand in the parallel proceedings at the U.S. Court of Appeals for the Second Circuit in order to reconsider the November 2007 Final Rule.[29]

EISA Authorizes DOE to Set Regional Standards

The Energy Independence and Security Act of 2007 (EISA, P.L. 110-140) was enacted on December 19, 2007. As an answer to DOE's prior claim, noted above, that it lacked the authority to set regional standards, Section 306 of the law empowered DOE to set regional energy efficiency standards for residential furnaces as well as central air conditioners and heat pumps. *This provision marked the first time that Congress authorized DOE to set regional efficiency standards—in order to account for geographic differences in heating or cooling needs*. The law specified that any DOE rule which establishes a regional energy efficiency standard must be accompanied by a base national "minimum" standard. Further, it directed that any regional standard for the furnace product "shall apply to any such product *installed* on or after the effective date of the standard." (emphasis added)[30] Thus, Section 306 authorized DOE to make a technical standard for manufacturers (the base national "minimum standard") and a higher

[25] Motion of the State of California to Intervene, State of New York et al. vs. U.S. Department of Energy, No. 08-0311 (2nd Cir. February 14, 2008).

[26] Petition of the Commonwealth of Massachusetts to Exempt from Federal Preemption Massachusetts' 90% Annual Fuel Utilization Efficiency Standard for Non-Weatherized Gas Furnaces (October 1, 2009), available at http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/ma_state_petition.pdf.

[27] DOE, "Energy Conservation Program for Consumer Products: Commonwealth of Massachusetts Petition for Exemption from Federal Preemption of Massachusetts' Energy Efficiency Standard for Residential Non-Weatherized Gas Furnaces," 75 *Federal Register* 62115, October 7, 2010, http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/ma_petition_denial.pdf.

[28] DOE noted that, in its 2006 notice of proposed rulemaking (NOPR) for residential furnaces, it had analyzed the potential energy savings from a 90% AFUE regional standard for the northern tier of the country—but rejected the idea based on its lack of authority. The 2006 NOPR had stated that, "As discussed in the 2004 ANOPR [Advanced Notice of Proposed Rulemaking], the Department has determined that EPCA does not authorize DOE to set regional energy conservation standards; instead, the Department can only establish national standards.... None of the comments received in response to the 2004 ANOPR provided a basis for changing that determination. However, the Department notes that EPCA allows states to seek from the Department a waiver of Federal preemption of state or local energy conservation standards." DOE, *Energy Conservation Standards for Residential Furnaces and Boilers; Proposed Rule*, October 6, 2006, p. 59209.

[29] Order Granting Voluntary Motion for Remand, State of New York et al. vs. U.S. Department of Energy (No. 08-0311) and Natural Resources Defense Council vs. U.S. Department of Energy (No. 08-0312) (April 22, 2009).

[30] EISA §306.

regional "installation standard." All other previous DOE energy efficiency standards for consumer products—whether set by statute or by regulation—only created national technical standards for manufacturers. In another departure from past practice, Section 308 of the law specified that DOE could employ a "direct final rule" process to implement new regional standards. That process differed from the traditional notice-and-comment rulemaking process that had been used for all previous DOE rulemakings for efficiency standards.[31]

Collaborative Negotiation Process

EISA Section 308 empowered DOE to set standards based on an "expedited rulemaking" that involved a collaborative negotiation process:[32]

> On receipt of a [consensus] statement that is submitted jointly by interested parties that are *fairly representative of relevant points of view* (including representatives of manufacturers of covered products, States, and efficiency advocates), as determined by the Secretary, and contains recommendations with respect to an energy or water conservation standard.[33]

Section 308 defined the outcome of such a DOE rulemaking process as a "direct final rule." In 2008, representatives of key manufacturers and energy efficiency advocacy organizations began a collaborative process to design the next round of energy efficiency standards for residential furnaces and other equipment covered by EISA Section 306.[34]

The new process for a direct final rule was hailed by representatives of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI)[35] and the American Council for an Energy-Efficient Economy (ACEEE)[36] as a breakthrough in regulatory rulemaking:

> The agreement is without precedent. If accepted by Congress and the Department of Energy, it will profoundly change strategies for achieving greater energy efficiency. First, the agreement will *avoid the long, expensive, and unpredictable process of a DOE rulemaking*, giving manufacturers predictable standards to meet with cost-effective, innovative, products. Second, the agreement will ultimately *shift some enforcement responsibility from manufacturers to distributors, contractors, and local officials*, because

[31] American Public Gas Association (APGA) website, *APGA Files Brief Challenging DOE's Direct Final Rule on Furnace*, May 14, 2012, http://www.apga.org/files/public/correspondence/PR%20APGA%20Files%20brief%20challenging%20DOE%27s%20direct%20final%20rule%20on%20furnaces.pdf.

[32] Collaborative negotiation processes had been used previously, for other appliance efficiency standards-making activities. EISA §308 may mark the first time that such a process was set as a requirement.

[33] EISA §308 (a). Emphasis added.

[34] Since the mid-1990s, this type of collaborative process has become a de facto standard operating procedure in the appliance energy efficiency standard-setting process. In general, the collaborative organization negotiates issues between the two contending groups and offers its consensus recommendation to DOE. That consensus position often becomes the starting point for the DOE rulemaking activity. The collaborative process has smoothed out the standard-setting process and greatly reduced the number of legal battles over DOE rules.

[35] AHRI is the trade association representing manufacturers of heating, cooling, and commercial refrigeration equipment. With more than 300 members, the Institute is an internationally recognized advocate for the industry, and develops standards for and certifies the performance of many of the products manufactured by industry members. In North America, the heating, ventilation, air conditioning, and refrigeration industry produces more than $20 billion worth of product, and in the United States alone, Institute members employ approximately 130,000 people and support some 800,000 dealers and contractors. The AHRI website is at http://www.ari.org/site/318/About-Us.

[36] ACEEE is a nonprofit, tax-exempt organization focused on policy analysis that can serve "as a catalyst to advance energy efficiency policies, programs, technologies, and investments." The ACEEE website is at http://www.aceee.org/about.

> efficiency levels will vary regionally. In addition, the agreement reaches out to call for changes to building codes that will lead to more efficient structures by allowing states to increase the standards for reference buildings in new homes (emphasis added).[37]

In late 2009—after months of negotiations—the two groups signed a consensus agreement to set new standards for residential furnaces and other EISA-identified products.[38] A summary of the agreement was also published.[39] For indoor (non-weatherized) natural gas furnaces, the agreement called for a base national (minimum) standard of 80% annual fuel utilization efficiency (AFUE)[40] and a "northern" regional standard of 90% AFUE.[41]

DOE Rulemaking Framework

Based on this new authority granted by EISA, DOE initiated a *regional standards* rulemaking for residential furnaces, heat pumps, and central air conditioners. The discussion in this section, and in those that follow, focuses mainly on efficiency standards policy design and issues for natural gas furnaces, but much of the discussion would also apply to issues for the other equipment.

Rulemaking Analysis Plan

In March 2010, DOE published a *Rulemaking Analysis Plan (RAP)* for residential furnaces.[42] The *RAP* lays out the key elements and models that DOE used to estimate energy savings for a number of furnace efficiency levels. DOE's modeling exercise involved engineering and economic analysis to estimate energy prices, trial energy efficiency levels, and equipment energy use. DOE also modeled manufacturer costs, price markups, product (sale) prices, consumer costs, lifecycle costs, and payback periods. Further, DOE modeled potential impacts on manufacturers, utilities, employment, and selected environmental emissions.

In the *RAP*, DOE stated that it expected similar industry impacts from a new direct final rule as those it had experienced in its previous rulemaking for this equipment. The *RAP* laid out three

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[37] ACEEE Summer Study on Energy Efficiency in Buildings, *The Regional Standards Agreement for Residential Furnaces, Air Conditioners, and Heat Pumps: Process, Results, and Implications*, 2010, http://aceee.org/files/proceedings/2010/data/papers/1923.pdf.

[38] The document was titled: *Agreement on Legislative and Regulatory Strategy for Amending Federal Energy Efficiency Standards, Test Procedures, Metrics and Building Code Provisions for Residential Central Air Conditioners, Heat Pumps, Weatherized and Non-Weatherized Furnaces and Related Matters.* Fed. Reg. 76, 210 (October 31, 2011), p. 67037.

[39] AHRI et al., *Fact Sheet on Air Conditioner, Furnace, and Heat Pump Efficiency Standards Agreement*, 2009, http://www.appliance-standards.org/sites/default/files/1009hvac_fact.pdf.

[40] An 80% standard for annual fuel utilization efficiency means that 80% of the input energy is converted to useful hot air (in furnaces), steam (in radiators), or hot water (in radiators) that is then circulated to provide space heating.

[41] A population-weighted annual heating demand greater than 5,000 heating degree-days was used by DOE to define the northern states that would be subject to a higher regional standard than the base (minimum) standard. A heating degree day (HDD) is a measurement designed to reflect the demand for energy needed to heat a building. Specifically, HDD is the number of degrees that a day's average temperature is below 65 degrees Fahrenheit (18 degrees Celsius), which is the temperature below which buildings need to be heated. The map in **Appendix D** shows the states that DOE included in its definition of the northern region for furnace standards. The 30 states are: Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

[42] DOE, *Energy Conservation Standards for Residential Furnaces: Rulemaking Analysis Plan*, March 11, 2010, http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/furnaces_framework_rap.pdf. Some additional details about DOE's *RAP* economic model design and analysis appear in **Appendix C**.

potential ways that the new standards could affect industry. First, DOE anticipated that new regional standards could disrupt existing supply chains. Second, DOE foresaw that the supply chain disruption could raise management and compliance costs. Third, DOE expected that those cost increases were likely to cause industry to mark up its prices.[43] While the preceding tensions did exist, the new regional standards and the direct final rule process led to additional industry concerns—as noted in the following sections.

Also in March 2010, DOE published a notice that it had received the consensus agreement produced by the collaborative negotiation process.[44] The notice requested public comment on the proposed percentage efficiency requirements, the proposed regional divisions, and the proposed compliance dates for residential furnace standards.[45]

DOE Publishes a Direct Final Rule (DFR)

As noted previously, EISA Section 308 allows DOE to establish an energy efficiency standard by direct final rule based "... *on the receipt of a [consensus] statement* submitted jointly by interested persons that are fairly representative of relevant points of view." (emphasis added) Section 308 also directed DOE to initiate, simultaneously, a parallel alternative—a "traditional" notice-and-comment rulemaking process—that it could trigger later if opposition to a direct final rule surfaced. In June 2011, DOE published a direct final rule (DFR) in accordance with the authority granted by Section 308 of EISA that included standards for non-weatherized (indoor) residential natural gas furnaces.[46] DOE interpreted its direction from EISA to include events that would trigger the choice of implementing either the DFR or a traditional rulemaking:

> A notice of proposed rulemaking (NOPR)[47] that proposes an identical energy efficiency standard must be *published simultaneously* with the final rule, and DOE must provide a public comment period of at least 110 days on this proposal.[48] Not later than 120 days after issuance of the direct final rule, *if one or more adverse comments or an alternative joint recommendation are received relating to the direct final rule, the Secretary must determine whether the comments or alternative recommendation may provide a reasonable basis for withdrawal* under 42 U.S.C. 6295(o) or other applicable law. If the Secretary makes such a determination, *DOE must withdraw the direct final rule and proceed with the simultaneously-published NOPR.* (emphasis added)[49]

[43] See discussion of DOE's *RAP* in **Appendix C**.

[44] 75 *Federal Register* 12144, March 15, 2010.

[45] 75 *Federal Register* 12146, March 15, 2010.

[46] "Energy Conservation Program: Energy Conservation Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps, Direct Final Rule," 76 *Federal Register* 37408, June 27, 2011.

[47] The NOPR appears at 76 *Federal Register* 37549.

[48] 42 U.S.C. 6295(p)(4).

[49] "Energy Conservation Program: Energy Conservation Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps, Direct Final Rule," 76 *Federal Register* 37408, June 27, 2011, p. 23

Table 1. DOE Rulemaking: Standards for Selected Technologies

(The rule covers 14 types of furnaces, air conditioners, and heat pumps)

Technology / Device	National Standard	Regional Standard	Original Target Implementation Date
Non-Weatherized (Indoor) Gas Furnace[a]	80% AFUE	90% AFUE for northern states	May 1, 2013
Split System Central Air Conditioner	13 SEER[b]	14 SEER for southern and southwestern states	January 1, 2015
Split System Heat Pump[c]	14 SEER	no regional standard set	January 1, 2015

Source: DOE, *Direct Final Rule*, 76 *Federal Register* 37408, June 27, 2011.

Notes: The DOE rule covers seven types of natural gas, oil, and electric furnaces, and seven types of central air conditioners and heat pumps. So far, most of the controversy has focused on the proposed standards for non-weatherized furnaces.

a. AFUE stands for annual fuel utilization efficiency. DOE proposed a higher regional standard of efficiency for furnaces that would apply to 30 northern states, which are listed in footnote 39 and shown in **Appendix D**.

b. SEER stands for seasonal energy efficiency ratio. A higher SEER means less energy is required to produce the same amount of air conditioning. Thus, a higher SEER represents a higher level of energy efficiency. DOE proposed a higher regional standard for central air conditioners that would apply to 15 southern states and six southwestern states, as shown in **Appendix D**. For more about central air conditioners, see http://energy.gov/energysaver/articles/central-air-conditioning.

c. DOE did not propose a regional standard for heat pumps.

Table 1 shows the standards for selected technology products, including non-weatherized natural gas furnaces. The DFR called for an 80% AFUE national (minimum) standard and a 90% AFUE northern regional standard.[50] Based on its analyses and projections of the standard's likely effects, DOE found that the standards would meet the basic EPCA requirements:

> [T]he benefits of today's standards (energy savings, positive NPV[51] of consumer benefits, consumer LCC[52] savings, and emission reductions) would outweigh the burdens (loss of INPV[53] for manufacturers and LCC increases for some consumers). DOE has concluded that today's standards represent the maximum improvement in energy efficiency that is *technologically feasible and economically justified*, and would result in the *significant conservation of energy*.[54] DOE further notes that products achieving these standard levels are already commercially available for all of the product classes covered by today's proposal (emphases added).[55]

[50] As noted above, these standards were based on the consensus statement issued by the parties to the collaborative.

[51] NPV stands for net present value. NPV compares the value of a dollar today to the value of that same dollar in the future, taking inflation and returns on investment into account. An NPV calculation uses a formula (with a "discount rate") to estimate the current dollar value of a money stream that is projected to run through future years.

[52] LCC stands for life-cycle cost. LCC is the sum of all recurring and one-time (non-recurring) costs over the full life span or a specified period of a good, service, structure, or system.

[53] INPV stands for industry net present value over DOE's 35-year analysis period. This is an application of NPV to cash flows for an entire industry.

[54] EPCA requires that those three conditions hold for all appliance and equipment efficiency standards. The conditions are also noted under EISA §306(a).

[55] DOE, *Energy Conservation Program: Energy Conservation Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps (Direct Final Rule, DFR)*, June 27, 2011, 76 *Federal Register* 37414.

Thus, DOE concluded that the expected benefits of the standard would outweigh the expected costs.[56]

In October 2011, the public comment period closed and DOE issued a notice confirming adoption of the DFR.[57] The notice addressed several adverse comments that were submitted in response to the DFR. DOE determined that the adverse comments did not provide "a reasonable basis for withdrawing" the DFR.[58]

Estimated Energy Savings

The DFR specified that:

> Pursuant to EPCA, any new or amended energy conservation standard that DOE prescribes for certain products, such as the residential furnaces (furnaces) and residential central air conditioners and central air conditioning heat pumps (air conditioners and heat pumps) that are the subject of this rulemaking, shall be designed to 'achieve the maximum improvement in energy efficiency ... which the Secretary determines is technologically feasible and economically justified.' (42 U.S.C. 6295(o)(2)(A)). Furthermore, the new or amended standard must 'result in significant conservation of energy.'[59]

In the DFR, DOE reported that the new energy efficiency standards that were scheduled to take effect on May 1, 2013, would yield an estimated 3.4 to 4.4 quads[60] of cumulative energy savings over a 30-year period.[61] Those energy savings were estimated to avoid the need for about 4 billion watts (gigawatts, GW) of power plant construction and reduce carbon dioxide emissions by an estimated 113 to 143 million metric tons.[62] For non-weatherized gas furnaces with a 90% AFUE, DOE estimated an average life-cycle cost savings of about $150 and a payback period of about 10 years.[63]

The DFR also discussed the potential for a rebound effect on estimated energy savings.[64] The rule stated that "the rebound effect for residential space heating appears to be highly variable, ranging from 10% to 30%. Based on [a] review, DOE incorporated a rebound effect of 20% for furnaces in the direct final rule analysis."[65]

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[56] Ibid.

[57] DOE, "Energy Conservation Program: Energy Conservation Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps (Notice of effective date and compliance dates for direct final rule)," 76 *Federal Register* 67037, October 31, 2011.

[58] Ibid.

[59] DOE, *Direct Final Rule (DFR)*, 76 *Federal Register* 37410.

[60] One "quad" equals one quadrillion British thermal units (Btus). One quadrillion is equal to the number 10 raised to the 15th power—or a million (10 raised to the 6th power) billion (10 raised to the 9th power).

[61] DOE, *Direct Final Rule (DFR)*, 76 *Federal Register* 37412. This estimate includes all equipment covered by the DFR, including gas furnaces, central air conditioners and heat pumps. The values were estimated in 2009 dollars. The period begins with the scheduled compliance date for each equipment category (2013 for furnaces and 2015 for other equipment) and ends in 2045.

[62] Ibid.

[63] Ibid. at 37503, 37507.

[64] A rebound effect could occur when a piece of equipment that is more efficient (and thus cheaper to operate) is used more intensively, so that the expected energy savings from the efficiency improvement may not fully materialize.

[65] 76 *Federal Register* 37468. This point, and much of the other discussion of the rebound effect, was also presented in the DOE *Rulemaking Analysis Plan*, pp. 51-53.

In a subsequent discussion of the value of consumer benefits, DOE's comments in the DFR reflected on the value of the foregone energy savings: "As previously discussed in section IV.F, because the rebound effect provides consumers with increased value (i.e., a more comfortable environment), DOE believes that, if it were able to monetize the increased value to consumers added by the rebound effect, this value would be similar in value to the foregone energy savings."[66]

"Lead Time" for Compliance Date

In the DFR, DOE reported on its perception of the statutory time frame applicable to the regional standards rulemaking process:

> *EPCA establishes a lead time between the publication of amended energy conservation standards and the date by which manufacturers must comply with the amended standards* for both furnaces and central air conditioners and heat pumps. For furnaces, EPCA dictates an eight-year period between the rulemaking publication date and compliance date for the first round of amended residential furnace standards, and a five-year period for the second round of amended residential furnace standards. (42 U.S.C. 6295(f)(4)(B)–(C)) DOE has concluded that the remand agreement [for the combined cases of State of New York v. DOE and NRDC v. DOE] for furnaces does not vacate the November 2007 Rule for furnaces and boilers. Therefore, the November 2007 Rule completed the first round of rulemaking for amended energy conservation standards for furnaces, thereby satisfying the requirements of 42 U.S.C. 6295(f)(4)(B). As a result, the current rulemaking constitutes the second round of rulemaking for amended energy conservation standards for furnaces, as required under 42 U.S.C. 6295(f)(4)(C), *a provision which prescribes a five-year period between the standard's publication date and compliance date*. (emphasis added)[67]

However, the *Consensus Agreement* published in early 2010 included a May 1, 2013, compliance date for the gas furnace regional standard—an even shorter lead time period of slightly more than three years. AHRI initially supported this shorter period, observing that "DOE has the authority to adopt the accelerated standards compliance dates in the consensus agreement whether DOE proceeds via a conventional rulemaking process or via direct final rule."[68]

DOE, in turn, stated that it "agrees with AHRI, Rheem, and NRDC that in circumstances where the manufacturers who must comply with the standard support acceleration of the compliance date of the standard (such as in the case of the consensus agreement where compliance dates were an integral part of the agreement), DOE has some flexibility in establishing the compliance dates for amended energy conservation standards."[69]

A further passage of the DFR reinforced the use of a shortened agreement-specified period, observing that "DOE believes that the applicable statutory provisions (i.e., 42 U.S.C. 6295(f)(4)(C) for furnaces and 42 U.S.C. 6295(d)(3)(B) for central air conditioners and heat pumps) necessitate a five-year time period between the final rule publication date and the compliance date. *The only exception would be in the case of the adoption of the consensus agreement....* " (emphasis added)[70]

[66] Ibid. at 37487.

[67] Ibid. at 37425.

[68] Ibid. at 37426.

[69] Ibid.

[70] Ibid. at 37427.

Enforcement Rulemaking

Enforcement Framework Document

EISA Section 306 directed DOE to initiate a separate rulemaking for *enforcement of the regional standards* within 90 days after the direct final rule and to complete the rulemaking within 15 months after the DFR publication date. In December 2011, DOE published a *Regional Standards Enforcement Framework Document* which reflected that: "The Department recognizes that regional standards present new certification, compliance, and enforcement issues. Congress ostensibly anticipated these issues and explicitly required DOE to initiate rulemaking for enforcement of regional standards."[71]

The *Enforcement Document* anticipated the differences between "traditional" standards for manufacturers and the new regional standards, which would be determined by geographic location of the installation:

> In adopting amendments to EISA authorizing establishment of regional standards, Congress recognized that an *entirely new enforcement framework* would be needed. Under the amended energy conservation standards framework, the base national standard applies to the manufacturer (including importers). Compliance with the base national standard is entirely determined by whether the covered product complies with the standard for that covered product applicable at the time of manufacture (or importation). *Under regional standards, the applicable standard is determined by the installation location of the covered product* (emphases added). [72]

Also, the new focus on the point of installation had the effect of moving the standard down the equipment distribution supply chain. This, in turn, accelerated the timing of the effect of a regional standard on distributors and installers (contractors) relative to a standard that only affects manufacturers:

> Regional standards also *differ from a base national standard with respect to the compliance date* of the standard for a particular product. The current base national standard applies to products "manufactured or imported" on or after the effective date of the standard. (42 U.S.C. § 6295(o)(6)(E)(i)(II)) Regional standards apply to products "installed" on or after the compliance date of the standard. (42 U.S.C. § 6295(o)(6)(E)(ii)) This requirement places a burden for compliance with a regional standard at the point of installation. (emphasis added)[73]

The *Enforcement Document* acknowledged that the impact of regional standards would extend beyond the usual effects on manufacturers to have new types of effects on distributors and contractors. In it, DOE proposed three alternative modes of information production that industry participants could use to demonstrate compliance:

> DOE is also considering the appropriate roles and responsibilities of other parties, such as distributors and contractors, that might be involved in compliance with regional standards ... An effective regional standards enforcement program will include participation by manufacturers, distributors, and contractors. The program should not overburden any one participant, nor should it overtax DOE with an impractical enforcement mandate. DOE has

[71] DOE, *Regional Standards Enforcement Framework Document*, December 2, 2013, p. 1, http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/furncac_regstnd_enforceframework.pdf (hereinafter *Enforcement Document*).

[72] Ibid.

[73] Ibid.

> developed *three potential approaches* to enforcement of regional energy conservation standards for central air conditioners, heat pumps, and furnaces to facilitate discussion regarding the elements of an effective enforcement program. (emphasis added)[74]

Industry Comment on Information Alternatives

Representatives from all three industry sectors—manufacturers, distributors, and contractors (installers)—expressed strong opposition to DOE's proposals to expand industry information processing requirements in order to demonstrate compliance with regional standards. For the most part, industry requested that past compliance information requirements be continued with added support from the online AHRI equipment certification directory[75] and a revision of Federal Trade Commission (FTC) Energy Guide labels.[76] More details about industry comments are presented in the section below on Implementation Issues.

Guidance on Regional Installation Standard

EISA specifically tied the compliance date for regional standards to the date of installation. In a May 17, 2012, letter to DOE, AHRI sought clarification of the relevant regulatory provisions and urged DOE to tie the compliance date for regional standards only to the date of product manufacture, and not to the installation date.[77]

In response—on June 28, 2012—DOE clarified its intent to administer an installation standard by providing a one-page "Final Guidance" document about its plans for enforcement of regional standards.[78] DOE stated that it was constrained by statutory language to enforce an installation compliance date for regional standards in addition to a manufactured compliance date for national standards. Specifically, DOE noted that it was constrained by language in EISA which provided that the base national standard shall "...*apply to all products manufactured or imported into the United States on and after the effective date of the standard*," but which also provides in the same section that "...*[a]ny additional and more restrictive regional standard … shall apply to any such product installed on or after the effective date of the standard*…." DOE stated that those terms have very distinct and different meanings, and that Congress clearly differentiated between the two within EISA §306. DOE stressed that it was not at liberty to adopt a contrary interpretation that would violate the law.[79]

[74] DOE, *Enforcement Document*, pp. 3-4.

[75] The AHRI site is at https://www.ahridirectory.org/ahridirectory/pages/home.aspx.

[76] For more about the FTC energy guide labels, see http://www.consumer.ftc.gov/articles/0072-shopping-home-appliances-use-energyguide-label.

[77] AHRI, "Re: Notice of Compliance Burden for May 1, 2013, Effective Date of Non-Weatherized Gas Furnace Minimum Efficiency Standards Published in June 27, 2011, Federal Register," May 17, 2012, http://images.magnetmail.net/images/clients/AHRI/attach/ChuLetter051712.pdf.

[78] DOE, *Final Guidance on Residential Furnaces, Central Air Conditioners, and Heat Pumps*, June 28, 2012, http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/csc_hp_furnaces_regstnddate_faq_2012-06-28.pdf. Note: other documents often refer to this document with a July 2, 2012, date.

[79] DOE, *Guidance Document*, emphases are from original.

Delays of DFR and Enforcement Rule

DFR Takes Longer Than Expected

In a May 2012 letter to DOE, AHRI observed that DOE's efforts to formulate a direct final rule took much longer than industry had expected, with direct consequences for the amount of available lead-time remaining for industry adjustments:

> *We did not anticipate that it would take DOE nearly a year and a half to publish a direct final rule* adopting the standards as federal regulations. Nevertheless, AHRI did not object when the direct final rule prescribed a compliance *lead-time for non-weatherized gas furnace standards that had been compressed to a period of less than two years*. By the time DOE confirmed the direct final rule at the end of October 2011, the lead time for compliance with the furnace standards had been *further compressed to 18 months*. Industry was willing to live with that reduced amount of lead time despite it being *much less than the minimum three-year lead time originally anticipated by the industry when the consensus standards were presented to the DOE* in January 2010. Although, historically and as a general rule, the Energy Policy and Conservation Act (EPCA) has provided the HVAC [heating, ventilation, and air conditioning] industry at least 5 years lead time for compliance with amended residential product standards, the industry accepted less lead time in presenting the consensus standards to DOE and even less time than that following DOE's delay in adopting the consensus standards.[80]

Thus, from AHRI's view, it was willing to accept a reduction in lead-time from five years down to about 18 months.

Enforcement Compliance Rulemaking Not Completed

While focused on the May 2013 target implementation date, AHRI anticipated that DOE would need to issue a final compliance enforcement rule by the end of 2012. However, AHRI noted that the "delay in the anticipated DOE rulemaking on enforcing the new standards has added complexity and uncertainty that potentially make it very difficult for industry to prepare for compliance."[81]

DOE's *Final Guidance* document was silent on how DOE would make a final decision about compliance information requirements. The urgency of making such a decision may have been eclipsed by the mounting importance of court action, which ultimately prompted DOE to agree with the American Public Gas Association (APGA)[82] to vacate the DFR as it applied to the gas furnace regional standard. That court action is reviewed in the last section of this report.

Implementation Design Issues

As part of the authorization for DOE to adopt a direct final rule, EISA directed DOE to seek public comment on the proposed rule. According to DOE, the law stipulated that

[80] AHRI, "Re: Notice of Compliance Burden for May 1, 2013, Effective Date of Non-Weatherized Gas Furnace Minimum Efficiency Standards Published in June 27, 2011, Federal Register," May 17, 2012, http://images.magnetmail.net/images/clients/AHRI/attach/ChuLetter051712.pdf.

[81] As of November 20, 2013, DOE had not yet issued a final enforcement rule. For more about the enforcement rulemaking, see AHRI's comments in the following section on "Need for Time Extension."

[82] APGA is a trade organization that represents publicly-owned natural gas local distribution companies. It has over 700 members in 36 states. The APGA website is at http://www.apga.org/i4a/pages/index.cfm?pageid=3289.

> if one or more adverse comments or an alternative joint recommendation are received relating to the direct final rule, the Secretary must determine whether the comments or alternative recommendation may provide a reasonable basis for withdrawal under 42 U.S.C. 6295(o) or other applicable law. If the Secretary makes such a determination, DOE must withdraw the direct final rule and proceed with the simultaneously published [Notice of Proposed Rulemaking].[83]

Three main industry issues were raised through this public comment process. A description of those issues—both industry concerns and DOE responses—follow.

Compliance Date Issue: Manufactured vs. Installed

Costs of Stranded Inventory

In July 2012, the Air Conditioning Contractors of America (ACCA)[84] expressed concern that the regional standard could strand large amounts of furnace inventory:

> [T]he new regional standards must abide by "installed by" rules in order to be compliant when the pending regulations begin to go into effect next year [May 1, 2013]. This determination has the potential to wreak havoc on *hundreds of millions of dollars* worth of inventory and shorten supplies of residential heating equipment in the Northern region in the months before the new rule's compliance date. (emphasis added)[85]

ACCA noted that, previously, whenever the DOE set new minimum efficiency standards, it set a "manufactured by" compliance system that allowed for covered products legally manufactured to the older standard to be sold and installed after the compliance date. In this case, however, the new "installed by" compliance system would require that on or after May 1, 2013, it would be unlawful to install an 80% residential gas furnace or mobile home furnace in the 30 northern states.[86] Although DOE preparation of the final enforcement rules were not finished, ACCA observed that the *Guidance Document* made it clear that DOE did not intend to allow for a "*sell through period"* for natural gas furnaces or mobile home furnaces (emphasis added).[87]

Need for Time Extension

On July 30, 2012, AHRI petitioned DOE for an 18-month extension of the May 1, 2013, compliance date for the regional gas furnace standard. Several factors and concerns drove industry's effort to extend the amount of time available for compliance.

First, AHRI emphasized that the choice to use an installation date would be an important departure from the consensus agreement: "*Making the effective date of the regional standard for*

[83] DOE, "Notice Confirming Adoption of the DFR," 76 *Federal Register* 67037, October 31, 2011.

[84] ACCA is a trade association representing installers of, and service providers for, indoor energy equipment and services. Its membership includes more than 60,000 contractors and 4,000 businesses. The ACCA website is at http://www.acca.org/about/.

[85] ACCA, *DOE Regional Standards Ruling Could Strand Millions Worth of Inventory*, July 3, 2012, https://www.acca.org/archives/industry-resources/government-affairs/hot-air/7320.

[86] The 30 northern states, shown in **Appendix D**, are Alaska, Colorado, Connecticut, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

[87] ACCA, *DOE Regional Standards Ruling Could Strand Millions Worth of Inventory*, July 3, 2012, https://www.acca.org/archives/industry-resources/government-affairs/hot-air/7320.

furnaces the date of installation instead of the date of manufacture is not what the parties that signed the consensus agreement contemplated, and it effectively advances the implementation of the standard by a minimum of eight months. That is the amount of time it would take distribution channels from manufacturers to distributors to installers to do what is necessary to avoid having stranded inventory as of May 1, 2013." (emphasis added)[88]

Second, AHRI explained the need from the manufacturers' perspective:

> This extension of the standards' effective date is needed in order for manufacturers to have adequate time to prepare for compliance with regional furnace standards and related standards enforcement and product labeling requirements, and to ensure that any changes in furnace minimum standards are timed to coincide with the start of the 2014-2015 heating season.[89]

The requested delay, AHRI noted, would enable manufacturers to avoid economic losses and market disruptions for the 2012-2013 and 2013-2014 heating seasons.

Third, distributors and installers emphasized the need for additional "sell-through time" to avoid losses from stranded inventory. HARDI (the association of equipment distributors)[90] and ACCA supported the AHRI-proposed extension. HARDI stressed that the DOE approach to regional standards had been very difficult for distributors,[91] and AHRI stressed the economic importance of coordinating the projected preparation time needed with the compliance date constraint:

> We request that DOE grant this petition as soon as possible, but by no later than September 15, 2012; otherwise manufacturers and distribution channels will begin to incur significant market disruptions and economic losses as they will have to re-position product offerings and distribution for the upcoming heating season. The 18-month delay would make the effective date November 1, 2014. This is still two years before what would have been the normal effective date for these standards and less than two years from DOE publication of its enforcement rule, assuming that DOE publishes this rule near the end of this year [2012].[92]

Uncertainties about requirements for enforcement and product labeling were additional concerns that prompted industry efforts to extend the time period for compliance. AHRI cited the fact that DOE had not yet prescribed the final enforcement information measures that manufacturers,

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[88] AHRI, "AHRI Petition for an 18-Month Extension of the May 1, 2013, Effective Date of Amended Federal Minimum Efficiency Standards for Residential Non-Weatherized Gas Furnaces," July 30, 2012, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/06-2012/The%20Honorable%20Steven%20Chu%207-30-12.pdf.

[89] Ibid.

[90] HARDI is a trade association that represents heating, ventilation, air-conditioning, and refrigeration equipment ("HVACR") distributors. It is comprised of nearly 1,000 member companies, over 450 of which are U.S.–based wholesalers. More than 80% of HARDI's distributor members are classified as small businesses. Collectively, HARDI members employ over 30,000 U.S. workers and represent over $25 billion in annual sales and an estimated 90% of the U.S. wholesale distribution market of HVACR equipment, supplies, and controls. USCA Case #11-1485, *Motion to Intervene of the Heating, Air-Conditioning & Refrigeration Distributors International ("HARDI")*, filed January 20, 2012, p. 2, http://causeofaction.org/wp-content/uploads/2012/01/Motion-to-Intervene-by-HARDI-filed-20-Jan-2012.pdf.

[91] Ibid.

[92] AHRI, "AHRI Petition for an 18-Month Extension of the May 1, 2013, Effective Date of Amended Federal Minimum Efficiency Standards for Residential Non-Weatherized Gas Furnaces," July 30, 2012, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/06-2012/The%20Honorable%20Steven%20Chu%207-30-12.pdf.

distributors, and installers would be required to take in order to establish compliance with regional standards. The AHRI petition emphasized that:

> Inasmuch as *DOE has not even published a proposed rule on regional standards enforcement* and recognizing that under the Energy Policy and Conservation Act (EPCA) DOE has 15 months from the date it prescribes regional standards to prescribe regional standards enforcement rules, AHRI assumes that it will be the end of the year [2012] before a final rule is published ... if [the final rule] imposes an obligation to track products or to submit additional information, *manufacturers should be allowed a minimum of 12 months to begin compliance*. Distributors and contractors will, of course, have their own compliance lead time needs depending on what they are required to do by the final rule. (emphasis added)[93]

Also, AHRI noted that product labeling for regional standards enforcement would require several months of lead time for compliance. In conclusion, AHRI reflected on the new process, while requesting an adjustment to the compliance date: "Regional standards and direct final rules are new both to DOE and to industry and other stakeholders, and all of us are learning from experience. AHRI has readily engaged in negotiating consensus standards ... [w]e ask that DOE recognize and appreciate where we started from and how much we compromised and *adjust the furnace standards' effective date* to allow manufacturers, as well as distribution channels, adequate time to prepare for compliance."[94]

Compliance (Enforcement) Information Issue

DOE Proposes Alternative Information Requirements

As previously noted, DOE has an enforcement rulemaking responsibility attendant to its standards rulemaking charge. In December 2011, DOE solicited comments on its *Regional Standards Enforcement Framework Document*. DOE noted that an effective enforcement program design would set compliance information burdens on the manufacturers, distributors, and contractors in a way that neither overburdens any one industry participant nor overtaxes DOE. Three approaches were proposed, to offer alternative ways to distribute the information burdens. Under each approach, the tracking and recordkeeping requirements would apply only to units (equipment) that were required to meet a regional standard.[95]

1. Approach 1 would require that *manufacturers* track the serial numbers of units shipped to each distributor location and that distributors maintain records demonstrating that purchasers acknowledged the regional limits applicable to each unit.[96]
2. Approach 2 would require manufacturers *and distributors* to maintain records of the distributor/contractor to which each unit of a covered product was distributed. *Contractors would be required to maintain a record for each unit installed, including the unit's serial number and installation address*. The only information reported to DOE would be the certification reports filed by the manufacturers.[97]

[93] Ibid.

[94] Ibid.

[95] These approaches also assume various labeling, notification, and information requirements would be imposed by the Federal Trade Commission (FTC) as part of a coordinated enforcement program.

[96] DOE, *Enforcement Document*, p. 4.

[97] DOE, *Enforcement Document*, pp. 4-5. This approach would allow for a record keeping system that the Department

3. Approach 3 would require a complete tracking system for each individual unit *by serial number starting with the manufacturer all the way through the distribution chain until the actual installation*. This approach would place a heavier burden on manufacturers, distributors, and contractors but would provide a very comprehensive and effective enforcement program.[98]

The remainder of the document lays out more details about the information role and record-keeping requirements for manufacturers, distributors, and contractors.

Industry Objects to New "Information Burden"

In response to DOE's solicitation of comments on its *Regional Standards Enforcement Framework Document*, three major industry associations—APGA,[99] AHRI,[100] and HARDI[101]—filed responses in February 2012.[102] AHRI subsequently presented a collective industry viewpoint in an article published in March 2012.[103]

Information Burdens Pose Major Barrier

AHRI described DOE's three proposed approaches from an industry perspective. Overall, AHRI found that:

> *None of the three potential enforcement schemes in the framework document will provide an appreciably higher rate of compliance* with the regional standard than [the existing system].... All of the three schemes will create an unnecessary administrative burden at all levels of distribution, inject DOE into existing business practices, and add unnecessary cost for all parties involved in the distribution and installation of equipment.... (emphasis added)[104]

More specifically, AHRI identified the first approach as the one most similar to existing industry requirements. That approach could, AHRI noted, be made workable by modifying the FTC's

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could track by requesting the information from each party in the distribution chain.

[98] DOE, *Enforcement Document*, p. 5. This approach would require contractors to maintain records of each serial number and installation address for installed units and to provide that information to the distributor. The distributor would be required to compile the information from multiple contractors and submit the basic model number, efficiency, serial number of the unit, and zip code of the installation to DOE for review. Distributors would be responsible for ensuring the distributors or contractors to whom it provides units are installing the units in appropriate regions and that all units are properly reported to the Department.

[99] APGA, *Comments of the American Public Gas Association on Regional Standards Enforcement Framework Document*, February 6, 2012, http://www.apga.org/files/public/federal%20filings/APGA%20Waiver%20Comments%20020612.pdf.

[100] AHRI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/02-2012/DOE%20Reg%20Enforce%20NODA%20Com%202-6-12.pdf.

[101] HARDI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012, http://www.regulations.gov/#!documentDetail;D=EERE-2011-BT-CE-0077-0015.

[102] Also, the Furnace Waiver Design Group (which includes ACCA and a variety of other organizations) filed its response to the DOE request for comments. Furnace Design Group, http://ftc.gov/os/comments/regionaldisclosurenprm/560904-00003-83225.pdf.

[103] AHRI, *Industry Responds to Regional. Enforcement Proposals*, March 12, 2012, http://www.achrnews.com/articles/119550-industry-responds-to-regional-enforcement-proposals.

[104] AHRI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012, p. 6, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/02-2012/DOE%20Reg%20Enforce%20NODA%20Com%202-6-12.pdf.

Energy Guide labels.[105] The second and third approaches, AHRI observed, both require additional record-keeping and reporting requirements, including the tracking of hardware serial numbers by distributors and contractors.[106]

Regarding the options for product tracking and information reporting, the AHRI article stressed that AHRI does not support additional reporting requirements for regional standards beyond the reporting called for under current regulations.[107] As for record-keeping, AHRI recommended that "DOE should recognize the existing record-keeping schemes."[108]

To emphasize the points about the potential for a new burden of record-keeping and reporting, AHRI stressed that "there are *over 10 million serial- numbered residential HVAC units* (packaged AC/HP, split system coil, split system, condensing unit, or furnace) *installed each year*. The potential paperwork burden under the most ambitious program outlined in the framework document would be overwhelming." (emphasis added)[109]

In arguing for a more status quo approach, AHRI emphasized the statutory basis for the role of industry trade associations in the information certification process:

> The Energy Independence and Security Act (EISA) of 2007 includes a statement that the DOE Secretary shall use, to the maximum extent practicable, *nationally recognized certification programs of trade associations* to enforce standards. The AHRI [online equipment certification] directory is the authoritative source for certified performance information on the residential furnaces and residential central air conditioners and heat pumps available for installation in the U.S. (emphasis added)[110]

Aside from the different features in its three proposed alternatives for information requirements, DOE has not stated publically any objections that it might have to the use of an industry-based certification program.

Industry Prefers FTC-AHRI Option

DOE's adoption of regional standards also triggers an equipment-labeling requirement for the Federal Trade Commission (FTC). EPCA directs the FTC to initiate a rulemaking within 90 days after DOE publishes a final rule for regional standards. FTC is directed to determine one or more methods for disclosing equipment information in a way that consumers, distributors, contractors, and installers can easily determine whether the device installed in a specific building conforms to

[105] The familiar yellow-and-black Energy Guide labels help consumers comparison-shop for energy-efficient appliances, lighting, and plumbing products by providing an estimate of the products' energy consumption or energy efficiency. Manufacturers of most major home appliances are required to attach the labels to their products under the FTC's Appliance Labeling Rule. The labels show the highest and lowest energy consumption or efficiency estimates of similar appliance models. FTC designs the labels in cooperation with DOE. For more about the labels see http://www.ftc.gov/opa/reporter/shopping/energyguides.shtml.

[106] AHRI, *Industry Responds to Regional. Enforcement Proposals*, March 12, 2012, http://www.achrnews.com/articles/119550-industry-responds-to-regional-enforcement-proposals.

[107] AHRI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012, p. 5, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/02-2012/DOE%20Reg%20Enforce%20NODA%20Com%202-6-12.pdf.

[108] Ibid., p. 6.

[109] Ibid.

[110] Ibid., p. 3. AHRI states that, "The directory is relied upon by the contracting, building and consulting engineering community to develop specifications and to determine the efficiency of matched components. To facilitate DOE's use of AHRI's certification programs to the maximum extent practicable, AHRI stands ready to reformat its directory to make clear the appropriate efficiency requirements by region."

the regional standard. The FTC is required to complete this rulemaking no later than 15 months after publication of the final rule that establishes the regional standards.[111]

In support of the DFR, FTC initiated a parallel and supplementary rulemaking to update its Energy Guide labels for furnaces and other hardware. FTC initiated this action by publishing an Advanced Notice of Proposed Rulemaking in late 2011.[112] FTC published a proposed rule in June 2012,[113] and issued a final rule in February 2013.[114]

Instead of adopting one of the DOE-proposed approaches, AHRI offered a possible expansion of the existing mechanism, in which each link in the equipment supply chain could play a role in the compliance information process: "AHRI commits to working with DOE to develop those tools to raise awareness throughout the [distribution] channel,[115] building upon the recommended revisions to the FTC label and suggested DOE public awareness campaign."[116]

AHRI's ideal enforcement regime would limit manufacturers' obligation to inform distributors. In its view, because only a few products would require enforcement of a regional standard, the enforcement goal could be met with some revisions to FTC energy labels.

To address the information compliance issue, AHRI proposed modifications to the FTC label for residential furnaces, air conditioners, and heat pumps:

> *We believe that the objectives of FTC and DOE can be met through revisions to the existing Energy Guide labels alone, and that no additional reporting requirements should be imposed on manufacturers* ... While revising its existing Energy Guide labels, *FTC should consider incorporating a reference in all labels to the AHRI directory of certified product performance*, www.ahridirectory.org, so that consumers can ensure that the correct equipment is installed in their region. The AHRI directory of certified equipment currently plays an important role in helping consumers make informed decisions when purchasing residential furnaces and central air conditioners and heat pumps. We believe that the AHRI directory can even play a bigger role with the implementation of regional standards *to ensure that contractors select the right products* and that consumers get equipment that can meet the regional standards. We recommend that FTC allow the AHRI directory of certified products to be one of the approved methods for disclosing information associated with the *new regional standards for residential furnaces* and central air conditioners and heat pumps. (emphasis added)[117]

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[111] DOE, *Enforcement Document*, p. 1. DOE cites to 42 U.S.C. §6295(o)(6)(H)(i), (iii).

[112] FTC, "Appliance Labeling Rule," 76 *Federal Register* 72872, November 28, 2011, http://www.gpo.gov/fdsys/pkg/FR-2011-11-28/pdf/2011-30436.pdf.

[113] FTC, "Appliance Labeling Rule," 77 *Federal Register* 3337, June 6, 2012, http://www.ftc.gov/sites/default/files/documents/federal_register_notices/16-cfr-part-305-request-comments-proposed-rule-concerning-disclosures-regarding-energy-consumption/120531energylabeling.pdf.

[114] FTC, "Energy Labeling Rule," 78 *Federal Register* 8362, February 6, 2013, http://www.gpo.gov/fdsys/pkg/FR-2013-02-06/html/2013-02225.htm.

[115] AHRI notes that products covered by regional standards are often sold through a multiple channel distribution process from the manufacturer, to a distributor, to an installing contractor, and finally to the end consumer. At each step the businesses in the distribution process can raise awareness of regional standards through bulletins, meetings, and sales literature.

[116] AHRI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012, p. 3, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/02-2012/DOE%20Reg%20Enforce%20NODA%20Com%202-6-12.pdf.

[117] AHRI, *AHRI Comments—Regional Labeling for Heating and Cooling Equipment*, February 6, 2012, pp. 1-2, http://www.ftc.gov/os/comments/regionaldisclosuresanpr/00003-82667.pdf.

In conclusion, AHRI stressed that, "The Federal Trade Commission (FTC) *Energy Guide labels* for residential furnaces, air conditioners and heat pumps, modified as proposed by AHRI, *will be the single most useful tool for effectively implementing the regional standards*." (emphasis added)[118]

From the distributors' perspective, HARDI asserted its opposition to new and additional forms of record-keeping relative to past requirements.[119] HARDI found that all three of DOE's proposed enforcement approaches would "put unprecedented burdens on distributors."[120] HARDI stated further that current standards enforcement and certification procedures are "fully capable" of ensuring compliance:

> HARDI believes the current certification system, as managed by AHRI, is more than capable of assuring energy efficiency compliance.... We believe that the proposal from the AHRI to the FTC regarding an updated energy-efficiency label ... [combined with] voluntary inter-channel communication, and consumer and contractor education done by the DOE will prove sufficient in securing compliance with the law.[121]

In support of its view, HARDI noted that, in February 2013, the FTC changed its Energy Guide labeling rule to add regional information and a map to the labels used for residential furnaces and central air conditioners. The FTC's final rule requires the Energy Guide label on product packaging, at the point of sale, on websites, and on the product hardware.[122]

From the contractor (installer) perspective, ACCA expressed strong opposition to DOE's proposals,[123] and stated a preference for an approach most similar to the current compliance information requirements for efficiency standards.

Gas Furnace Installation Issue

Installation Challenges for 90% Regional Standard

In September 2012, ACCA raised technical installation concerns about the regional natural gas furnace standard. One concern was that the 90% AFUE standard could only be met by the use of condensing furnaces.[124] That type of furnace, it said, has such a low amount of exhaust gases that it cannot use a chimney and, thus, must be vented through a side wall.[125] ACCA elaborated that

[118] AHRI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012, p. 2, http://www.ahrinet.org/App_Content/ahri/files/NEWSLETTER/02-2012/DOE%20Reg%20Enforce%20NODA%20Com%202-6-12.pdf.

[119] HARDI, *DOE Outlines Possible Enforcement Options for Regional Standards*, December 2, 2011, http://wholesaleobservations.blogspot.com/2011/12/doe-outlines-possible-enforcement.html.

[120] HARDI, *DOE Outlines Possible Enforcement Options for Regional Standards*, December 2, 2011, http://wholesaleobservations.blogspot.com/2011/12/doe-outlines-possible-enforcement.html. Further, HARDI claimed that the law precludes DOE from requiring distributors to help with enforcement.

[121] AHRI, *Industry Responds to Regional. Enforcement Proposals*, statement by Aniruddh Roy, AHRI regulatory engineer.

[122] FTC, "FTC Approves Final Revised Energy Labeling Rule for Home Heating and Cooling Equipment," January 25, 2013, http://www.ftc.gov/opa/2013/01/energylabeling.shtm.

[123] AHRI, *Industry Responds to Regional. Enforcement Proposals*, statement by Aniruddh Roy, AHRI regulatory engineer.

[124] EIA notes that about 35% of gas furnaces sold nationally in 2012 were 90% AFUE or higher. EIA, *Gas Furnace Efficiency Has Large Implications for Residential Natural Gas Use,* 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=14051.

[125] EIA observes that, "Switching from a noncondensing to condensing gas furnace often requires modifying the

such venting is a problem for some residential buildings, such as row houses. "The requirement that non-weatherized furnaces installed in the north[ern] region meet a minimum 90% AFUE poses potential installation issues for contractors and their customers. In certain cases, adequately addressing the ventilation and condensate requirements for higher efficiency may cause the installation costs to increase considerably or make the installation impractical or impossible."[126]

Under certain conditions, EISA §306 allows for waivers of the regional standard. ACCA noted that the waiver possibility created another source of uncertainty—about enforcement of the furnace rule. ACCA described its concern:

> Preliminary documents outlining DOE's enforcement plan indicate the agency may create a 'waiver' from the requirement to install condensing furnaces in the North[ern] region 'to mitigate the unintended consequences of a condensing furnace standard for residential furnaces in the Northern Region for a select subset of installations that may be severely impacted.' The waiver process would allow a trained contractor to determine whether a specific installation job would qualify for a waiver, then file documentation with the Department of Energy after the installation. It's important to note that until the DOE finalizes the enforcement rule,[127] it is unknown whether waivers will be allowed, the criteria for allowing them, or the exact process to obtain one. But the fact waivers are being considered is causing some confusion about the new furnace rule.[128]

Thus, although the waiver provision appears to have been designed to help create flexibility for addressing potential barriers to a regional standard, ACCA viewed it as contributing to uncertainty about enforcement of the rulemaking.

Pressure to Switch from Gas to Electric

In its comments on DOE's *Enforcement Framework Document*, APGA contended that DOE's proposed regional standard rule could cause consumers to switch fuels:

> One of APGA's main concerns regarding the DFR analysis is that, by forcing consumers in the Northern Region to replace non-condensing furnaces with condensing furnaces in order to meet the new 90% AFUE standard, the new rule will precipitate substantial fuel switching from gas-fired furnaces and water heaters to their electric (or other, such as kerosene) counterparts—a result that undermines the policy goals of the Energy Policy and Conservation Act.[129]

APGA stressed that, for a standard to address a key problem of the DFR—specifically, the assumption that life cycle energy and cost savings will prevent fuel switching—the standard must

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furnace ventilation at additional expense. In some cases the switch may require retrofitting or abandoning a gas-fired water heater because the existing exhaust flue would be poorly sized for the existing water heater and new furnace." EIA, *Gas Furnace Efficiency Has Large Implications for Residential Natural Gas Use*, 2013.

[126] ACCA, *Questions Remain About New Minimum Efficiency Standards for HVAC Equipment*, September 6, 2012, https://www.acca.org/archives/industry-resources/government-affairs/hot-air/7565.

[127] As of January 2014, DOE had not published a final enforcement rule. Presumably, this action was halted in light of the legal challenges to the DFR and regional standards, as described in the final section of this report. As of November 20, 2014, DOE had still not published a final enforcement rule—presumably due to court to remand and restart the rulemaking process.

[128] ACCA, *Questions Remain About New Minimum Efficiency Standards for HVAC Equipment*, September 6, 2012, https://www.acca.org/archives/industry-resources/government-affairs/hot-air/7565.

[129] APGA, *Comments of the American Public Gas Association on Regional Standards Enforcement Framework Document*, February 6, 2012, p. 1, http://www.apga.org/files/public/federal%20filings/APGA%20Waiver%20Comments%20020612.pdf (hereinafter APGA, *Comments*).

account for the income level of the affected consumers.[130] DOE, it stated, concludes that most affected consumers will act in an economically rational fashion and hence will not switch from gas to electric equipment. APGA finds DOE's logic faulty, noting:

> The problem with DOE's rationale is that there are many millions of lower income persons for whom the key determinant—in fact, the only determinant—is the up-front cost disparity for purchase and installation of gas equipment versus electric equipment;[131] the record in the DFR proceeding [and other documents] ... are crystal clear that, on the basis of up-front costs, fuel switching will occur. Lower income consumers do not make decisions regarding household appliances such as furnaces and water heaters based on life cycle costs because they are living paycheck to paycheck (assuming they are employed at all) and hence make economic choices based on immediate out-of-pocket costs.... The only way to mitigate this unintended but certain outcome of the DFR is a meaningful waiver provision.[132]

Based on that view, APGA advocated for two distinct waiver provisions: one based on income level, and one based on characteristics of the building. In the first case, APGA stressed that an "effective" waiver must allow all gas consumers below a certain income level to "self-certify" to that effect, thereby permitting them to "replace a non-condensing furnace with a [new] non-condensing furnace if they choose."[133] APGA observed that such a self-certification approach has worked for the Low Income Home Energy Assistance Program (LIHEAP),[134] which supports those needing assistance in paying for their home energy needs.[135] However, APGA argued that the LIHEAP level of income eligibility is too low to be "fully effective" for residential furnace waiver qualification.[136] Instead, APGA proposed that 250% of the poverty level "will catch most, though certainly not all." of the lower income customers that would otherwise switch to another fuel.[137]

In the second case, APGA recommended a waiver provision targeted to all row houses, and any similar residential buildings, for an exemption from the 90% AFUE standard—regardless of the income level of the occupants. This "blanket waiver" would require some "reasonable" DOE qualification to avoid any potential for gaming of the exemption.[138]

DOE Proposes Furnace Installation Waivers

One general approach DOE identified to address both the income and house characteristics issues would be a waiver process that could allow case-by-case exemptions from the regional standard. This approach could be designed as a new waiver process or could build upon DOE's existing

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[130] Additionally, APGA noted that the standard should also be simple, straight-forward, and easy to administer.

[131] APGA claimed that adoption of the DFR 90% AFUE standard for residential furnaces would cause substantial fuel switching, primarily by lower income customers who, when faced with the up-front costs of installing a condensing furnace, will not do so because there are less expensive first cost options. APGA, *Comments*, p. 5.

[132] APGA, *Comments*, pp. 2-5.

[133] APGA additionally assumes that the affected consumers have been fully informed in writing as part of the waiver process regarding the operating cost savings that could accrue to them over the life of an efficient (90% or higher) condensing furnace.

[134] For more about the LIHEAP program, see CRS Report RL31865, *LIHEAP: Program and Funding*, by Libby Perl.

[135] LIHEAP is administered by the Department of Health and Human Services (HHS).

[136] The LIHEAP eligibility level is currently set at the greater of 150% of the poverty level or 75% of the state median income.

[137] APGA, *Comments*, pp. 5-6.

[138] APGA, *Comments*, p. 8.

waiver process.[139] In the existing process, a party, such as a contractor, could apply for a waiver on an installation-specific basis, providing detailed information that demonstrated the need for a furnace that does not meet the applicable regional standard.

In regard to the house characteristics (row house) issue, DOE responded that it was aware of concerns that certain customers may have "stranded" appliances that share venting with a furnace and the attendant possibility of higher installation costs. DOE stated that it was open to considering alternatives to mitigate the unintended consequences of a condensing furnace requirement on a subset of installations in the northern region.

DOE requested public comment on the need for a waiver process and, if necessary, the types of information it should consider collecting, the degree of public access, and whether a waiver should be awarded by a "post-installation approval" or be available for all installations that are identical to one for which DOE had previously granted a waiver.[140]

Industry Responds to Proposed Waiver Process

Furnace Waiver Design Group[141]

In February 2012, the Furnace Waiver Design Group responded to DOE's request for comments on the *Enforcement Framework Document*.[142] The Group's main points were:

- DOE should establish a process to provide waivers from the new regional furnace standard.
- Waivers should be available where pre-determined criteria are met and eligibility is documented by the installer. No case-specific application to, or action by, DOE should be required.
- A waiver should be available only for furnace replacement in an existing home, and then only if: (a) building conditions or local regulatory restrictions effectively preclude installation of a condensing furnace, or (b) the incremental installation cost (of a condensing furnace relative to a non-condensing furnace) is prohibitive.
- An installer should be required to document eligibility for the waiver on a standardized form, to be subsequently submitted to DOE. Documentation should include building characteristics driving excessive incremental installation cost, regulatory constraints, and project cost data.

[139] The existing process is administered through DOE's Office of Hearing and Appeals.

[140] DOE, *Enforcement Document*, pp. 9-10.

[141] The Furnace Waiver Design Group is an ad hoc coalition of stakeholders participating in the regional standards rulemaking process. The Group developed a detailed policy proposal on appropriate waivers from the DOE final rule for regional furnace standards. The Group includes the Air Conditioning Contractors of America, Alliance to Save Energy, American Council for an Energy-Efficient Economy, American Gas Association, Appliance Standards Awareness Project, Consumer Federation of America, National Consumer Law Center, Natural Resources Defense Council, and Plumbing, Heating, Cooling Contractors - National Association on Regional Standards Enforcement Framework Document.

[142] Furnace Waiver Design Group, *Comments of the Air Conditioning Contractors of America et al on Regional Standards Enforcement Framework Document*, February 6, 2012, http://ftc.gov/os/comments/regionaldisclosurenprm/560904-00003-83225.pdf.

- Installers determining waiver eligibility should be required to have appropriate training and certification on the waiver process and criteria.
- In order to ensure that the waiver policy is working as intended, DOE should periodically review experience with the waiver policy to determine whether it needs adjustment. Any significant changes to the waiver policy should be accomplished through a public notice-and-comment process.[143]

HARDI

In its comments on the *Enforcement Framework Document*, HARDI expressed its concerns about DOE's proposed waiver process:

> HARDI opposes the waiver provision and feels the proposals and discussions of a waiver, which would allow for the installation of non-compliant equipment, are problematic on a variety of levels ... distributors have general concerns with the retroactive nature of the proposed waiver process, enforcement of the waiver and the potential for fraud.... Finally, a waiver process for installations is vastly different than the current test procedure and certification waivers DOE grants to a handful of manufacturers. We see no way a bureaucratic scheme could address, for example, emergency furnace replacements during the coldest seasons in the North, or emergency air-conditioning replacements during severe heat conditions in the South.[144]

In conclusion, HARDI recommended that DOE continue the current waiver criteria and enforcement process and that the Federal Trade Commission (FTC) embrace the AHRI proposal for an updated energy efficiency label. Further, HARDI surmised that the present certification system, as managed by AHRI, would be fully capable of assuring compliance with the regional energy efficiency standards.[145]

DOE Final Enforcement Guidance Unfinished

DOE's one-page *Final Guidance Document* was silent on making a final decision about waivers to address the issue of gas furnace installation problems. The urgency of making such a decision may have been eclipsed by the mounting importance of court action, which ultimately prompted DOE to agree with APGA to vacate the DFR as it applied to the gas furnace regional standard—thus leaving the waiver question unresolved. That court action on the DFR is reviewed in the next section.

[143] VanNess Feldman, *Memorandum Re: Disclosure of Permitted Communication Concerning Regional Standards Enforcement Framework Document*, February 13, 2012, http://energy.gov/sites/prod/files/memo_furnace_std_waiver_policy.pdf.

[144] HARDI, *Enforcement of Regional Standards for Residential Furnaces and Residential Central Air Conditioners and Heat Pumps*, February 6, 2012.

[145] Ibid.

Industry Challenges DOE Rulemaking in Court[146]

APGA Challenge to the DFR

In December 2011, APGA petitioned the U.S. Court of Appeals for the District of Columbia Circuit for review of the DFR.[147] The APGA contended that: (1) the 90% efficiency standard for the northern region constituted an effective ban on non-condensing residential furnaces in violation of Section 325(o)(4) of EPCA; (2) the use of a DFR to prescribe a standard that was contested on the merits by a number of parties violated Section 325(p)(4) of EPCA; and (3) DOE's actions in publishing the DFR were arbitrary and capricious and otherwise in violation of the requirements of the Administrative Procedure Act.[148] Over the ensuing months, a number of parties intervened in the dispute. Several trade organizations intervened in support of the APGA's challenge, while a number of environmental organizations and other groups intervened in support of DOE and the efficiency standards adopted in the DFR.

In January 2013, DOE and the APGA reached agreement on a settlement and filed a joint motion asking the court to vacate the portion of the DFR that established regional efficiency standards for residential natural gas furnaces and remand the dispute to DOE for a traditional notice and comment period prior to issuance of a final rule. Although the initial parties had both agreed to this settlement, the intervenors on both sides of the dispute opposed the request.[149] HARDI opposed the settlement on the grounds that it would leave the portions of the DFR that apply to central air conditioners and heat pumps in place.[150] HARDI argued that many of the issues raised in the APGA challenge applied to those standards as well as to the residential furnace standards.[151] HARDI also moved to be substituted for the APGA as the petitioner in the case so that the legal challenge to the DFR could continue for other equipment even if the court approved the proposed settlement.[152] DOE opposed this request for substitution for a number of legal and policy-related reasons.[153]

The proposed settlement was met with objections from the other side of the debate as well. Several environmental and consumer organizations also filed a motion opposing the DOE-APGA settlement.[154] These parties opposed remand of the DFR because they believed the efficiency standards of the DFR to be beneficial to consumers and the environment.[155] The motion also

[146] This section was prepared by Adam Vann, CRS Legislative Attorney.

[147] Brief for Petitioner, American Public Gas Ass'n vs. U.S. Dep't of Energy, No 11-1485 (D.C. Cir. May 14, 2012).

[148] Ibid. at 1-2.

[149] As the scheduled implementation date of May 1, 2013, approached, AHRI took action on its concern about lead time by filing a request, on March 4, 2013, that the Court stay the compliance date for the regional gas furnace standard.

[150] Response in Opposition Combined with Motion to Substitute Party filed by Heating, Air Conditioning and Refrigeration Distributors International, American Public Gas Ass'n vs. U.S. Dep't of Energy, No 11-1485 (D.C. Cir. January 25, 2013).

[151] Ibid.

[152] Ibid.

[153] Reply to Motion to Substitute Party filed by DOE, American Public Gas Ass'n vs. U.S. Dep't of Energy, No 11-1485 (D.C. Cir. February 7, 2013).

[154] Response in Opposition filed by Alliance to Save Energy et al., American Public Gas Ass'n vs. U.S. Dep't of Energy, No. 11-1485 (D.C. Cir. January 25, 2013).

[155] Ibid.

noted the long history of delays in the issuance of these efficiency standards.[156] Citing these delays, the parties argued that if the court granted the settlement and resulting remand to DOE for revision of the rule, it should impose a strict timeline for issuing the new rules.

In response to these challenges, the court granted motions to stay implementation of the DFR, which had been scheduled to take effect on May 1, 2013, until six months after it issued a decision on the proposed settlement.[157] The court also directed the parties to submit a joint proposed format for re-briefing the case.[158] This request was complied with on September 28, 2013, when APGA, DOE, and intervenors on both sides filed a proposed briefing schedule with the court.[159]

Negotiated Settlement

On March 11, 2014, DOE and APGA, as well as the various intervenors in the case, filed a joint unopposed motion for approval of a new settlement in which DOE agreed to seek a remand of the non-weatherized gas furnaces portion of the June 27, 2011, direct final rule.[160] Under this new settlement, the portion of the rule relating to energy conservation standards for non-weatherized gas furnaces were vacated and remanded to DOE for a new notice and comment rulemaking proceeding. Further, DOE agreed to (1) conduct an administrative proceeding to clarify its process related to direct final rules; (2) clarify its position regarding its enforcement authority vis-à-vis distributors; (3) exercise its enforcement discretion by not seeking civil penalties for violations of the regional air conditioner standards for 18 months, so as to alleviate problems related to product sell-through and stranded inventory; and (4) consider a negotiated rulemaking to address enforcement of regional standards for central air conditioners.[161]

On April 24, 2014, the Court approved the settlement agreement and issued an order that the standards established for non-weatherized gas furnaces and mobile home gas furnaces be vacated and remanded to DOE for further rulemaking.[162] As a result, the standards established by the DFR for the non-weatherized gas furnaces and mobile home gas furnaces will not go into effect. Instead, the standards previously established—but not implemented—for these product classes of furnaces in DOE's 2007 Final Rule will come into effect, with compliance required beginning on November 19, 2015.[163] However, the remaining portions of the challenged DFR, including the efficiency standards for other furnaces, central air conditioners, and heat pumps, remained in place.

[156] Ibid.

[157] Order Granting Emergency Motion to Stay Case and Directing that the Parties File Proposed Briefing Format American Public Gas Ass'n vs. U.S. Dep't of Energy, No. 11-1485 (D.C. Cir. May 1, 2013).

[158] Ibid.

[159] Joint Proposed Briefing Format, American Public Gas Ass'n vs. U.S. Dep't of Energy, No. 11-1485 (D.C. Cir. September 18, 2013).

[160] Joint Unopposed Motion to Vacate and Remand Case, American Public Gas Ass'n vs. U.S. Dep't of Energy, No. 11-1485 (D.C. Cir. March 11, 2014) (Joint Motion).

[161] Ibid.

[162] Order Granting the Joint Unopposed Motion to Vacate in Part and Remand For Further Rulemaking, American Public Gas Ass'n vs. U.S. Dep't of Energy, No. 11-1485 (D.C. Cir. March 11, 2014).

[163] Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers; 64 *Federal Register* 65136, November 19, 2007.

Details of Settlement Agreement and Next Steps

The Court order adopted all elements of proposed settlement, noting that "[t]he parties and intervenors have agreed that vacatur should accordingly be limited to the portions of the direct final rule and the notice of effective date that relate to energy conservation standards for non-weatherized gas furnaces."[164] Thus the energy conservation standards established in the DFR for other types of furnaces, central air conditioners, and heat pumps would be unaffected by the order partially vacating the DFR for further proceedings and would go into effect in accordance with the DFR.

However, with respect to non-weatherized residential gas furnaces, the settlement requires DOE to (1) make data available to the public prior to publishing a proposed rule;[165] (2) "use best efforts to issue a notice of proposed rulemaking regarding energy efficiency standards for non-weatherized gas furnaces within one year of the issuance of the remand in this case";[166] and (3) to issue a final rule within the later of two years of the issuance of the remand or one year of the issuance of proposed rule.[167]

As a result of the adopted settlement, the current national standard of 78% will remain in effect until November 19, 2015, when a new national standard of 80% will be established pursuant to the November 2007 Final Rule referenced above.

The adopted settlement also clarifies the applicable requirements for residential central air conditioners. As noted above, the settlement leaves in place the requirements for other products adopted in the DFR. Under the terms of the settlement, DOE is required to issue an "enforcement policy statement addressing the upcoming deadline for compliance with regional standards for central air conditioners."[168] Starting January 1, 2015, a national energy conservation standard will apply to all central air conditioners manufactured on or after that date, but regional standards will impose additional requirements in a number of states as well.[169] However, DOE also pledges that it will not seek civil penalties for violations of regional standards until July 1, 2016, due to "uncertainty created by the litigation and in an exercise of its enforcement discretion."[170]

Finally, under the terms of the settlement, DOE agreed to initiate a notice and comment rulemaking proceeding to clarify its process related to the promulgation of Direct Final Rules as a general matter.[171] To this end, DOE attached an addendum titled *Plan for Clarification of DOE Direct Final Rule Process*.

DOE Prepares for New Rulemaking

On July 21, 2014, DOE issued a final rule technical amendment that amended the relevant portions of its regulations to reflect the Court's order vacating the amended energy conservation

[164] Joint Motion, at 6.

[165] Ibid. at 7.

[166] Ibid.

[167] Ibid.

[168] Ibid. at 9.

[169] Ibid.

[170] Ibid. at 10.

[171] Joint Motion, at 12.

standards for non-weatherized gas furnaces (including mobile home furnaces). The final rule technical amendment was published on July 29, 2014.[172]

Pursuant to the settlement agreement, DOE has undertaken a new rulemaking process for residential gas furnaces. Per the agreement, DOE will issue a notice of proposed rulemaking within one year of issuance of the remand, including at least a ninety-day public comment period. DOE has also agreed to issue a final rule either within two years of the issuance of the remand or within one year of the issuance of the proposed rule.[173]

Also, the settlement agreement compels DOE to complete its enforcement guidance.[174] DOE is preparing a NOPR for this rulemaking. As one early step in that process, in June 2014, DOE issued a notice of intent to establish a negotiated rulemaking working group under the Appliance Standards and Rulemaking Federal Advisory Committee to negotiate proposed requirements for enforcement of regional standards.[175] The purpose of the working group is to discuss and reach consensus on a proposed rule.[176]

New Issue: Separate Product Classes

In October 2014, the American Gas Association (AGA) and APGA issued a white paper which recommends that DOE's new rulemaking for non-weatherized residential gas furnaces establish separate product classes for condensing and non-condensing furnaces. This recommendation was prompted mainly by an issue APGA raised previously: some residential buildings may not accommodate side-venting required by 90%-efficient condensing-type furnaces.

AGA and APGA asserted that:

> Condensing and non-condensing non-weatherized gas furnaces are significantly different in terms of the venting mechanisms they use, how they produce and dispose of condensate and the building environments in which they can be installed. These differences create important differences in consumer utility, and must be appropriately considered in DOE's standards development process.[177]

The two groups argue that, under the settlement agreement approved by Court order, DOE agreed to reconsider the question of whether condensing and noncondensing non-weatherized gas furnaces should be treated as separate product classes in any future rulemaking that covers those products. Further, they cite EPCA's "special rule for certain types or classes of products" as requiring DOE to establish separate standards for any group of covered products if the products

[172] 79 *Federal Register* 43927.

[173] DOE, *Energy Conservation Standards Activities: Report to Congress*, August 2014, pp. 25-26, http://energy.gov/sites/prod/files/2014/08/f18/16th%20Semi-Annual%20Report%20to%20Congress%20on%20Appliance%20Energy%20Efficiency%20Rulemakings.pdf.

[174] As noted previously, in late 2011, DOE issued a notice of data availability (NODA) that suggested possible approaches to the enforcement of regional standards for furnaces (and central air conditioners). The comment period closed on February 6, 2012.

[175] 79 *Federal Register* 33870.

[176] DOE, *Energy Conservation Standards Activities*, pp. 13 and 46-47. The working group will consist of representatives of parties having a defined stake in the outcome of the proposed standard, and will consult with experts on technical issues.

[177] AGA and APGA, *In the Upcoming Rulemaking on Amendments to the Minimum Efficiency Standards for Non-Weatherized Residential Gas Furnaces, DOE Should Employ Separate Product Classes for Condensing and Noncondensing Furnaces*, White Paper Developed by the American Gas Association and American Public Gas Association, October 22, 2014, http://www.apga.org/files/AGA%20Furnace%20Product%20Class%20Whitepaper.pdf (hereinafter *Upcoming Rulemaking*).

"have a capacity or other performance-related feature which other products within such type (or class) do not have and such feature justifies a higher or lower standard from that which applies (or will apply) to other products within such type (or class)."[178]

AGA and APGA conclude that, given the special performance-related characteristics and utility that non-condensing non-weatherized residential gas furnaces provide to consumers, "*EPCA requires that DOE establish separate product classes for condensing and non-condensing gas furnaces*." (emphasis added)[179]

Implications for Energy Efficiency Policy

Spurred by EISA, DOE attempted to employ two energy efficiency policy innovations in its formulation of the DFR for regional furnace efficiency standards. As the first policy to incorporate regional standards, it sought to expand the application of more efficient technology to the energy efficiency potential in northern states. Such an increased "extraction" of the energy efficiency "resource" there would parallel the way that new drilling technology can increase access to underground oil and natural gas reserves. Through DOE's upcoming rulemaking following from the court-approved settlement, the regional furnace standards policy initiative may yet be realized—though perhaps in a somewhat more limited application than may have been envisioned by the parties to the 2009 collaborative agreement that ultimately led to the DFR.[180]

The DFR policy mechanism was designed to accelerate the energy efficiency rulemaking process. In one aspect, it aimed to address the many years of delay in updating the furnace standards to reflect advances in technology.[181] In another aspect, it also aimed to reduce the amount of time required to formulate the standards. Clearly, industry concerns about the need for additional preparation and sell-through time to meet a new regional installation standard increased the complexity of the process relative to previous standards processes that had only targeted equipment manufacturing changeovers. The new unaddressed complexity ultimately led to court challenges and additional time delays.

In sum, the advent of regional standards may yet raise the efficiency levels in the northern states for gas furnace equipment retrofits and for outfitting newly constructed housing. Such action on standards would have the effect of increasing national energy savings. Meanwhile, implementation of the new standards—previously scheduled for 2013—may not occur before the year 2020. The delay in standards will clearly defer some energy savings. It is not clear whether

[178] AGA and APGA, *Upcoming Rulemaking*, p. 1.

[179] AGA and APGA, *Upcoming Rulemaking*, p. 2.

[180] Also, one report has suggested that the Court-adopted settlement which directs DOE to reformulate the residential gas furnace standard could influence the development of energy efficiency standards underway for several other types of products: "The Department of Energy's (DOE's) successful request for a federal appeals court to remand a contested natural gas furnace energy efficiency standard to the department raises questions over the fate of more than a dozen pending efficiency standards, as DOE rewrites the furnace rule to address criticisms [that] it would hinder efficiency. Whatever approach the department takes in the revised version of the gas furnace rule could have implications for how DOE crafts the slew of upcoming efficiency standards. That in turn raises questions over the department's ability to meet Energy Secretary Ernest Moniz' recently stated goal to approve the pending rules for various types of appliances within the next several months, as part of President Obama's Climate Action Plan to boost efficiency." Inside EPA's Clean Energy Report, *DOE Bid for Remand of Furnace Rule Spurs Doubts on Efficiency Agenda,* May 5, 2014.

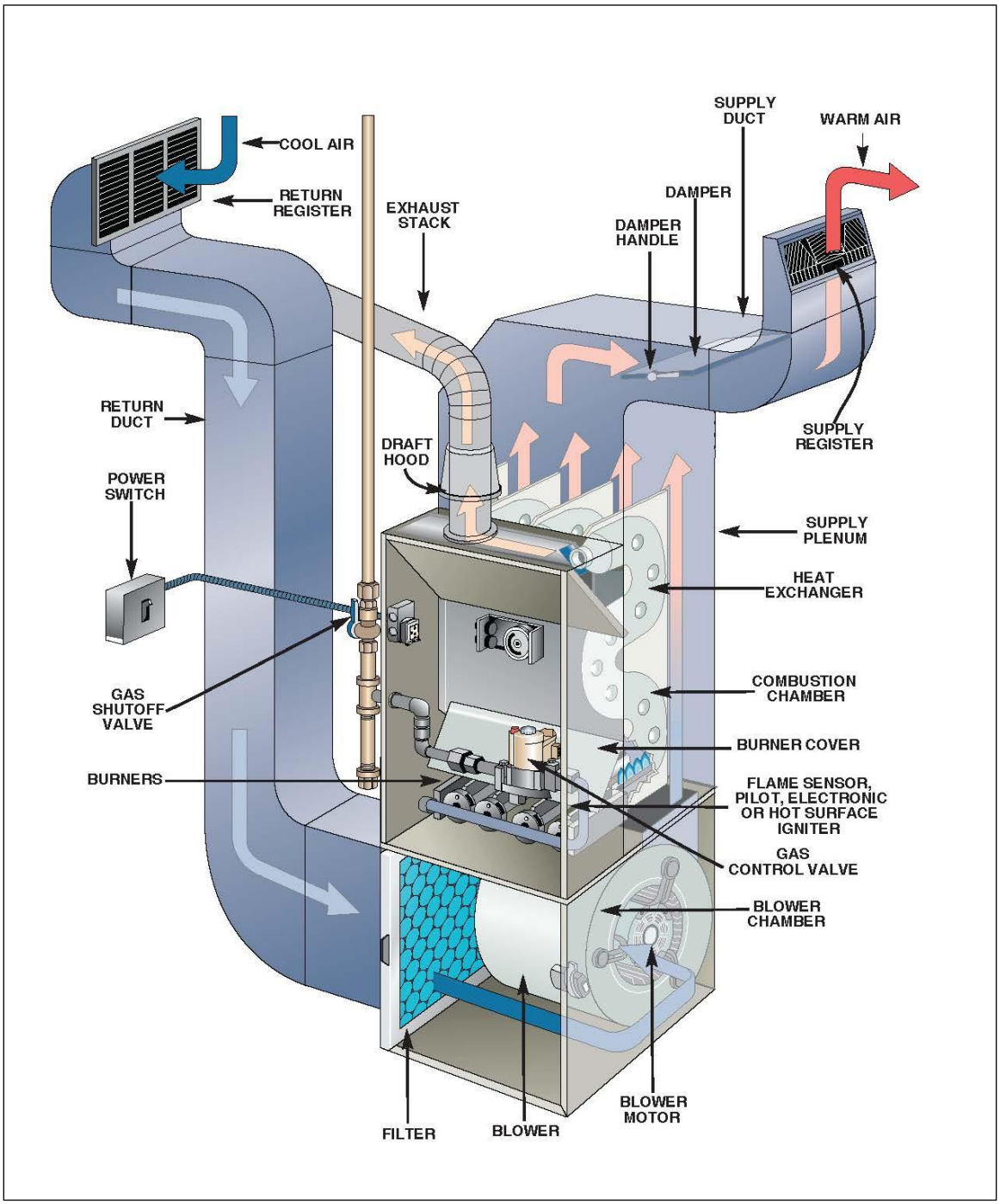
[181] The Government Accountability Office (GAO) has noted that previous delays in the formulating and updating of a broad range of energy efficiency equipment had led to substantial losses in potential energy savings. GAO, *Energy Efficiency: Long-Standing Problems with DOE's Program for Setting Efficiency Standards Continue to Result in Forgone Energy Savings*, GAO-07-42, 2007, http://www.gao.gov/new.items/d0742.pdf.

the delay would affect the achievement of savings targets for state energy efficiency resource standards.

Appendix A. Gas Furnace: Non-Condensing Type

Figure A-1. Non-Condensing Gas Furnace, with Air Handling Equipment

(The furnace is the rectangular unit, from the blower to the draft hood)



Source: The Family Handyman, *Fall Furnace Maintenance Guide*, http://www.familyhandyman.com/heating-cooling/furnace-repair/fall-furnace-maintenance-guide/view-all.

Notes: The elaborate ductwork that "snakes" its way through the household is not shown.

Appendix B. Chronology of the Regional Standards Policymaking Process

(Related to indoor, non-weatherized furnaces)

Date	Action
December 22, 1975	Energy Policy and Conservation Act (EPCA, P.L. 94-163) was signed into law. Title III contained provisions empowering the Federal Energy Administration (which later became part of the Department of Energy, DOE) to establish voluntary energy efficiency targets for various types of residential appliances and commercial equipment.
November 9, 1978	National Energy Conservation Policy Act (NECPA, P.L. 95-619) amended EPCA, directing DOE to replace voluntary targets with rulemakings to establish mandatory standards.
March 17, 1987	National Appliance Energy Conservation Act of 1987 (NAECA, P.L. 100-12) amended EPCA further, requiring that DOE set standards for residential furnaces. The amended law directed DOE to publish a "first final rule" by January 1, 1994, and an "amended final rule" by January 1, 2007.
August 8, 2005	Energy Policy Act of 2005 (EPAct 2005, P.L. 109-58) was enacted. Section 141 directed DOE to develop a plan to publish standards for several products—including residential furnaces—for which DOE had missed NAECA-specified rulemaking deadlines.
September 7, 2005	Fifteen states and several other parties sued DOE in the U.S. District Court for the Southern District of New York for failing to comply with 22 EPCA (as amended by NAECA) rulemaking deadlines This included a failure to publish the first final rule on amended standards for residential furnaces by January 1, 1994.
November 1, 2006	The District Court issued a *Consent Decree* order, requiring that DOE complete a rulemaking on residential furnaces by September 30, 2007.
November 19, 2007	DOE published a final rule to raise the gas furnace standard from 78% to 80% AFUE. During the rulemaking process, DOE considered regional standards for furnaces, but concluded that it lacked the legal authority to establish such standards.
December 19, 2007	Energy Independence and Security Act (EISA, P.L. 110-140) was enacted. Section 306 directed DOE to consider regional standards for residential furnaces, air conditioners, and heat pumps. Section 308 authorized DOE to use a new direct final rule (DFR) process.
January 17, 2008	Two legal challenges to the 2007 DOE furnace rule (80% AFUE) were filed in the U.S. Court of Appeals for the Second Circuit. The lawsuits challenged the legality of the standards, citing flaws in DOE's economic analysis.
2008 - 2009	The Air Conditioning, Heating, and Refrigeration Institute (AHRI), along with several HVAC manufacturers, energy efficiency groups, and others began negotiations for a collaborative agreement on regional standards that would satisfy EISA §306.
October 13, 2009	The Collaborative group reached a consensus and signed a consensus agreement.
January 15, 2010	The Collaborative group submitted a "joint petition" to DOE, transmitting its consensus agreement recommendations.
March 15, 2010	DOE published a notice that recognized the consensus agreement issued by parties to the collaborative process for standard-setting and published a rulemaking analysis plan (RAP) for residential furnaces.
June 27, 2011	DOE published a direct final rule (DFR) to establish regional standards for residential furnaces, air conditioners, and heat pumps. Also, DOE requested public comment on the rule.
October 31, 2011	DOE adopted the DFR. The standard for gas furnaces was scheduled to take effect on May 1, 2013, and the standards for heat pumps and air conditioners were set for January 1, 2015.

Date	Action
November 28, 2011	The Federal Trade Commission (FTC) published an advance notice of proposed rulemaking (ANOPR) to update its Energy Guide labels to reflect the new DFR on regional standards.
December 2, 2011	DOE issued a *Regional Standards Enforcement Framework Document*, which proposed a compliance strategy for the DFR.
December 7, 2011	DOE published a Notice of Data Availability, which solicited comment on the *Enforcement Framework Document*.
December 23, 2011	The American Public Gas Association (APGA) petitioned the U.S. Court of Appeals for the District of Columbia Circuit to vacate the portion of the DFR that would establish a regional standard for natural gas furnaces. APGA also requested that the DFR be remanded to DOE for a "traditional" notice-and-comment rulemaking process.
January 20, 2012	The Heating, Air Conditioning, and Refrigeration Distributors International (HARDI) moved to intervene in support of APGA.
February 6, 2012	APGA, AHRI, HARDI, and the Collaborative's Furnace Waiver Design Group filed comments with DOE on the *Enforcement Framework Document*.
April 30, 2012	The Court of Appeals set a schedule for the filing of legal briefs.
May 29, 2012	HARDI and the Air Conditioning Contractors of America (ACCA) filed a joint brief in support of APGA.
June 6, 2012	FTC issued a notice of proposed rulemaking (NOPR) for an updated version of its Energy Guide labels.
June 28, 2012	DOE published a one-page "final enforcement guidance" document to clarify the "installed-by" date for the regional standard.
July 30, 2012	AHRI requested that DOE provide an 18-month extension (to November 2014) of the regional gas furnace standard.
October 12, 2012	Several intervenors (including the City of New York and the Natural Resources Defense Council) for respondents (DOE and AHRI) submitted final briefs to the Court of Appeals.
Fall 2012	DOE and APGA discussed the potential for a settlement agreement under a Court-supervised mediation process.
January 11, 2013	APGA and DOE filed a joint settlement motion requesting that the Court vacate the gas furnace portion of the DFR and remand to DOE for a new notice-and-comment rulemaking.
January 25, 2013	HARDI filed a motion that objected to the requested settlement, moved to continue the regional standards court case, and sought to be substituted for APGA as petitioner in the case. The request for substitution attempted to broaden the case by seeking to also rescind the portions of the DFR that set standards for residential heat pumps and central air conditioners. In a separate action, several intervenors for respondents (New York, NRDC, et al.) moved to oppose the APGA-DOE motion to vacate the gas furnace rule, citing the need to accelerate a long overdue increase in the furnace standards.
February 6, 2013	FTC issued a final rule that established updated Energy Guide labels to be applied to equipment covered by the regional standards in the DFR. The rule was designed to take effect when the new standards go into effect.
February 7, 2013	DOE and AHRI (separately) moved to oppose the HARDI motion to substitute for APGA. In a separate action, intervenors for respondents (New York, NRDC, et al.) moved to oppose the HARDI motion to substitute for APGA.
February 19, 2013	HARDI issued a reply to DOE's opposition to HARDI's motion to substitute for APGA.
February 27, 2013	AHRI sent a letter DOE, that again sought to delay the May 1, 2013, enforcement date by 18 months (to November 2014).

Date	Action
March 2, 2013	AHRI filed a request that the Court "stay" the gas furnace standards pending judicial review; and grant an extension of the May 1, 2013, compliance date "should the Court uphold the furnace standards on the merits."
April 5, 2013	DOE released a statement indicating that it would not enforce the regional furnace standards until the Court ruled on the settlement agreement.
May 1, 2013	The Court of Appeals ordered postponement of the May 1, 2013, compliance deadline until six months after the Court issues a decision on the settlement agreement. Also, the Court ordered that the parties submit a joint proposed format for a re-briefing of the case.
May 13, 2013	APGA filed a request for reconsideration of the Court order, seeking Court action to (1) grant the joint APGA-DOE settlement motion to vacate gas furnace portion of the DFR, (2) deny HARDI's request to substitute as a petitioner, and (3) clarify that any additional briefing be limited to supplemental briefs.
May 28, 2013	DOE and several intervenors filed their concurrence with the APGA request for reconsideration and to limit any additional briefing requirements. In a separate action, HARDI filed a request that the Court deny APGA's motion for reconsideration.
August 19, 2013	The Court issued an order that denied APGA's motion to deny HARDI's request to substitute as the petitioner. Also, the order formally requested that the Court be briefed again on (1) the APGA-DOE settlement agreement, (2) HARDI's motion to continue the lawsuit, and (3) the merits of the lawsuit. All parties were advised to agree to a briefing schedule within 30 days.
September 18, 2013	All parties to the case filed a joint proposed briefing format with the Court. The proposed format included a series of six briefs covering three issues (settlement, substitution, and merits) with a total (collective) time limit of 115 working days.
December 9, 2013	The Court adopted the briefing schedule, which gave parties until mid-April 2014 to brief the court on the three issues—the settlement agreement between the APGA and DOE; HARDI's motion to continue the case; and the merits of the lawsuit itself. The briefing process was later dropped, with the re-establishment of a Court-supervised negotiation process.
February 18, 2014	DOE filed an abeyance motion, with consent of all parties involved, to suspend the briefing schedule until March 3 to accommodate pending mediation. The motion signified that all parties were nearing agreement on a settlement.
March 3, 2014	Parties requested a short extension to March 17, or sooner, by which time all parties and intervenor would "notify the court concerning the status of settlement negotiations, including approval and implementation. Counsel for all parties and intervenor have authorized [the parties] to state that they do not oppose the relief requested in this motion."
March 11, 2014	Parties in the case filed a joint settlement motion with the Court. The agreement would vacate the regional furnace efficiency standards and restart the rulemaking process, giving stakeholders more opportunities to provide input throughout the rulemaking process. In order to help avoid stranded inventory, the settlement would also give the industry an 18-month sell-through period to comply with the January 1, 2015, efficiency standards for split-system air conditioners. Also, as part of the agreement, DOE agreed to not penalize distributors as part of its enforcement of the standard.
April 24, 2014	The Court accepted the agreement, vacating the regional standard for non-weatherized furnaces and remanding it to DOE for further notice and comment rulemaking.
October 22, 2014	The American Gas Association and APGA issued a white paper contending that DOE's new rulemaking for non-weatherized residential gas furnaces should establish separate product classes for condensing and non-condensing furnaces.

Source: Various legal filings and trade press articles.

Notes: The June 28, 2012, date on DOE's final enforcement guidance document (1-page) is often referenced as July 2, 2012.

Appendix C. DOE Rulemaking Analysis Plan

Overview and General Approach

In March 2010, DOE published a notice of the consensus agreement and issued a *Rulemaking Analysis Plan (RAP)* for residential furnaces. The *RAP* is based on the energy-saving criteria specified in EPCA, as amended. As noted previously, in the background section, EPCA specified that any amended appliance ("covered product") efficiency standard must be designed to achieve the maximum improvement in energy efficiency that is "technologically feasible and economically justified."[182] Further, DOE may not adopt a standard that would not result in "significant conservation of energy."[183] In assessing an efficiency standard as "economically justified," DOE must determine that the benefits of using equipment that satisfies the standard would exceed its burdens.[184] This assessment must address public comments on the proposed standard and consider, "to the greatest extent practicable," several additional factors.[185]

To address the criterion of "technological feasibility" DOE assesses the full range of commercially available equipment and its associated energy efficiency levels. DOE then chooses several trial standard levels (TSLs) across the spectrum of available energy efficiency levels. To assess the economic justification criterion, DOE runs an elimination process for the TSLs. The process starts with the maximum technologically feasible level—the highest of DOE's selected TSL levels of energy efficiency—and then runs scenarios with successively lower efficiency levels until reaching a point where the level is economically justified. DOE must then assess whether that level would achieve a "significant amount of energy savings."

Market Participants and Distribution Channels

The *RAP* identified non-weatherized (indoor) natural gas furnaces as accounting for the dominant market share among the family of residential furnace equipment types:

> Because the large majority of residential furnace shipments fall into the non-weatherized gas product class, DOE will focus heavily on non-weatherized gas-fired furnaces. As a result, DOE plans to select units for teardown[186] that will include approximately 25 non-weatherized gas-fired furnaces, 4 weatherized gas-fired furnaces, 6 mobile home gas-fired furnaces, and 8 non-weatherized oil-fired furnaces.[187]

[182] 42 U.S.C. §6295(o)(2)(A).

[183] 42 U.S.C. §6295(o)(3)(B).

[184] 42 U.S.C. §6295(o)(2)(B)(i).

[185] As noted previously, these factors are (1) the economic impact on manufacturers and consumers, (2) operating cost savings over the estimated average life of equipment compared with any increase in price, (3) total projected energy savings, (4) any lessening of usefulness or performance, (5) any lessening of market competition, (6) the need for energy conservation, and (7) any other factors DOE deems relevant. DOE, *Rulemaking Analysis Plan (RAP)*, p. 3.

[186] The term "teardown analysis" describes DOE's process of estimating the manufacturer production costs of products through reverse-engineering (i.e., physically disassembling the products and examining existing product designs). DOE notes that the availability of a large number of residential furnaces across a wide range of efficiencies allows it to consider the technologies most commonly used by manufacturers to improve the energy efficiency of their products. Further, DOE asserts that the teardown analysis approach allows it to accurately estimate the manufacturers' cost of production. DOE, *RAP*, p. 34.

[187] DOE, *RAP*, p. 36.

In order to estimate the price "markup" that a manufacturer adds to furnace production cost,[188] DOE had to define furnace market participants and identify associated distribution channels (supply chains). The *RAP* describes the furnace distribution channel in simple terms:

> Most residential furnaces pass through the following distribution channel:[189] the original equipment manufacturer (OEM) assembles the system and sells it to a distributor;[190] the distributor sells the unit to a contractor; the contractor sells the unit to the final end-user and performs the installation. After installation, the contractor performs all service on the system, including inspection, maintenance, and repair.[191]

The *RAP* provides rich detail about the contractor portion of the channel, where the direct interaction with consumers takes place:

> Most contractors compete at the local level and the majority of them are small businesses. Many contractors carry products made by more than one manufacturer. Contractors interface with the end-user: installing new furnace systems to their specifications as well as inspecting, servicing, or repairing the existing system. *In the residential furnace market, contractors sell products as part of an installation package and do not list retail product prices separately from installation cost.* Furthermore, differences in local markets, weather conditions, and many other factors can affect the price [that] contractors charge for furnaces. (emphasis added)[192]

Potential Industry Impacts of Regional Standards

In the *RAP*, DOE stated that it expected similar issues for the new DFR rule as it had experienced in its previous rulemaking for this equipment. In describing DOE's methods for assessing potential impacts of regional standards, the *RAP* notes the similarities of the market participants and distribution channels for each of each of the three types of equipment covered by DOE's 2007 rule that called for an 80% AFUE standard:

> *Market participants in the residential furnace distribution chain are often represented by the same trade associations as those in the central air conditioning and heat pump distribution chain.* For the current [2007] central air conditioner and heat pump standards rulemaking, DOE conducted limited interviews with distributors and contractors, and sought comment regarding the potential impacts of regional standards as they relate to these products. Commenters noted that distributors and contractors of central air conditioners and heat pumps also service furnaces and face very similar issues with respect to regional standards. (emphasis added)[193]

DOE's *RAP* laid out three potential ways that the new standards could affect industry. First, DOE anticipated that new regional standards could disrupt existing supply chains. Based on the

[188] DOE used the markup to account for corporate non-production costs and profit. Thus, the resulting manufacturer selling price is the price at which the manufacturer can recover all production and non-production costs and earn a profit. DOE, *RAP*, p. 40.

[189] More generally, DOE found that the furnace distribution chain includes six types of market participants: (1) distributors, (2) dealers, (3) general contractors, (4) mechanical contractors, (5) installers, and (6) builders. Based on comments regarding the similarities of market participants, DOE considered three distinct categories of market participants: "distributors," "mechanical contractors," and "general contractors." The category of "mechanical contractors" includes dealers and installers. The category of "general contractors" also includes builders.

[190] Distributors receive shipments from manufacturers and resell the products at a markup to contractors. No other participant in the channel carries significant inventory, so distributors absorb imbalances between manufacturer supply and consumer demand.

[191] DOE, *RAP*, pp. 41-42.

[192] DOE, *RAP*, pp. 41-42.

[193] DOE, *RAP*, pp. 46-47.

comments of the distributors, the *RAP* recounted DOE's interpretation of their views and concerns:

> The distributors were concerned that possible disparities between the regional boundaries for standards and existing distribution boundaries may prove problematic. Distributors stated that regional standards may be defined based on geographic boundaries composed of state lines, which are usually different than the boundaries of markets for heating and cooling products. Additionally, distributors were concerned about the possible impact of regional standards on the efficiency of the distribution chain, and ultimately, their ability to control costs. National and regional distributors stated that they would face decreases in their economies of scale, which currently affect products that can be stocked and sold nationwide. They stated that if certain products could not be sold throughout the entire country, then the cost of those products in the regions where they could be sold would be driven up. They added that distributors [in] service areas that overlap borders between regions would be particularly affected, as their costs would increase due to the more complex and diverse inventories.[194]

Second, DOE foresaw that supply chain disruption could raise management and compliance costs. For furnace distributors and contractors, DOE anticipated that the regional standards would present two new challenges:

> Based on the ... interviews and its own preliminary market assessment, DOE believes there are two main ways in which regional standards could impact furnace distributors and contractors. First, because some distributors close to borders of regions may sell products in more than one region, complying with standards that differ across regions may cause these distributors to carry a different mix of inventory to fill orders in each region. The *inventory management costs* could increase or the overall investment in inventory could increase. Second, EISA 2007 allows for regional standards to be enforced at the installation level, in addition to the existing enforcement of national efficiency standards at the manufacturer level. As a consequence, there likely would be *new compliance costs* for distributors and contractors, involving at a minimum additional record-keeping and reporting. (emphasis added)[195]

Third, the DOE *Plan* also anticipated that distributors and contractors would respond to the above-noted cost increases by increasing prices:

> Based on its current assessment of the market, DOE believes that *any additional costs that regional standards may impose on furnace distributors and contractors would be reflected by a change in the markups* used by these entities. In its analysis of regional standards, DOE plans to estimate changes in markups based on an assessment of (1) the inventory that would likely be carried in various geographic areas (South, North, and border areas), and (2) the potential costs of enforcement requirements. (emphasis added)[196]

Some Key Economic Assumptions

Energy Price Assumptions

DOE's Appliance Standards Program planned to use the Energy Information Administration's (EIA's) projections of national average natural gas, propane, electricity, and fuel oil prices to residential consumers to estimate future energy prices. The most recent edition of EIA's *Annual*

[194] DOE, *RAP*, pp. 46-47.

[195] DOE, *RAP*, pp. 46-47.

[196] DOE, *RAP*, pp. 46-47.

Energy Outlook (AEO) was chosen to serve as the source of projections for future energy prices.[197]

Equipment First Cost vs. Life Cycle Cost

In order to analyze future monetary "first costs" of furnace equipment and the costs associated with the equipment's energy use through a long-term future, DOE had to select a value for the consumer discount rate:

> The calculation of [Life Cycle Cost] requires the use of an appropriate discount rate to determine the present value of operating expenses during the product lifetime. The discount rate used in the LCC analysis represents the rate from an individual consumer's perspective.... For consumers of residential furnaces, DOE plans to use the same approach that it relied on to develop discount rates for the November 2007 residential furnaces and boilers standards rulemaking (i.e., deriving the discount rates from estimates of the "finance cost" to purchase residential products).[198]

Potential Risk of Fuel Switching

The potential problem of fuel-switching (product-switching) was addressed in the *RAP*:

> DOE also plans to account for fuel and product switching that may result from standards requiring higher-efficiency furnaces. Because home builders are sensitive to first costs, a standard level that significantly increases the purchase price may induce some builders to switch to a different heating system. Such a standard level may also induce some home owners to replace their existing furnace with a different heating product, although in this case switching may incur additional costs to accommodate the different product. The decision to switch is also affected by the prices of the energy sources for competing products (i.e., the prices of natural gas and electricity). DOE's analysis will account for the key factors expected to influence fuel and product switching that may result from standards requiring higher-efficiency furnaces. DOE will take into consideration factors from the rulemaking on heat pumps that may influence fuel switching from furnaces, in particular the potential installed costs of heat pumps, which compete with furnaces in some markets.[199]

Estimating the Future Value of Energy Savings

To estimate the values for cumulative energy savings, DOE adopted OMB-specified guidelines for values of discount rates:

> According to U.S. Office of Management and Budget (OMB) guidelines for Federal agencies, DOE will conduct two NPV [net present value] calculations, one using a real discount rate of 3 percent and another using a real discount rate of 7 percent.[200] The discount rates for the determination of NPV are in contrast to the discount rates used in the LCC analysis, which are designed to reflect a consumer's perspective. The 7-percent real value is an estimate of the average before-tax rate of return to private capital in the U.S. economy. The 3-percent real value represents the "societal rate of time preference," which is the rate at which society discounts future consumption flows to their present value.[201]

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[197] DOE, *RAP*, pp. 54-55.

[198] DOE, *RAP*, pp. 54-55.

[199] DOE, *RAP*, p. 61

[200] The *RAP* refers to OMB, Circular A-4: Regulatory Analysis, 2003. DOE, *RAP*, p. 66.

[201] DOE, *RAP*, p. 66. The "societal rate" may include dollar values for environmental benefits of reduced energy use.

Key Issues for Public Comment

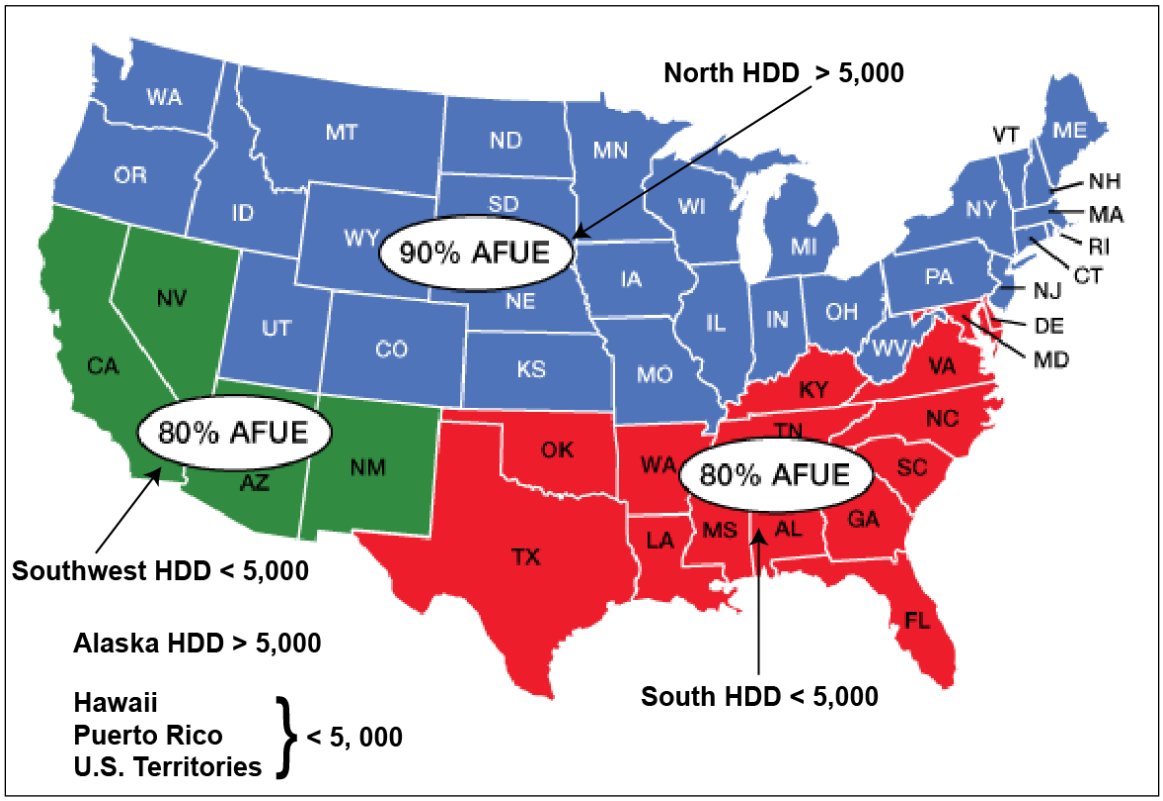
The *RAP* noted that DOE wanted to receive public comment on a variety of key issues, including:

- The consensus agreement;
- The combining of multiple equipment standards into a single rulemaking that covered residential central air conditioners, heat pumps, residential furnaces, and furnace fans;
- DOE's proposed definitions of regions, for the analysis of regional standards; and
- The viability of the regional standard enforcement mechanisms presented in the *RAP*, other mechanisms DOE should consider, and the extent to which these mechanisms would result in additional financial burdens to consumers, manufacturers, contractors, distributors, dealers, and installers. In particular, DOE stated an interest in data on how, if at all, the enforcement options would increase compliance costs and/or other costs.[202]

[202] DOE, *RAP*, p. 82.

Appendix D. Map of the Northern Region for Indoor (Non-Weatherized) Furnaces

Figure D-1. Regions for Furnace Efficiency Standards



Source: Adapted by CRS, with map from HARDI, *Regional Standards Details*, accessed November 19, 2013 http://www.hardinet.org/regional-standards-details, and information from map by ACEEE, *Fact Sheet on Air Conditioner, Furnace, and Heat Pump Efficiency Standards Agreement*, 2009, http://aceee.org/files/pdf/1009hvac_fact_0.pdf.

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